THE AMERICAN GAS LIGHT JOURNAL

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[OFFICIAL NOTICE.]

June Meeting, Society of Gas Lighting.

OFFICE OF THE SECRETARY, BROOKLYN, N. Y., June 4, 1895.

The June meeting of the Society of Gas Lighting will be held at the works of the New Haven (Conn.) Gas Light Company, at 3 P.M. of the 13th inst.

FRED. S. BENSON, Secretary.

Secretary Lathrop's Notification Respecting the Compiling of Statistics for the Ohio Association Anent the Use of Welsbach Lamps in Ohio.

OHIO GAS LIGHT ASSOCIATION,
OFFICE OF SECRETARY, COLUMBUS, O.

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Gentlemen: At the Eleventh Annual Meeting of the Ohio Gas Light Association, a resolution was adopted directing the Secretary to prepare blanks and send them to the various Gas Companies of the State, on which reports could be made showing the results obtained by the encouragement of the use of the Welsbach lamps.

In compliance with this resolution I inclose you blanks, sufficient for each month of the year, which I would like to have mailed to me as early as possible each month, in order that they may be carefully tabulated and prepared for our next meeting. You will, no doubt, appreciate the value the information thus obtained will be to our members.

Yours truly, A. P. LATHROP, Secretary.

[*Copy of Blank Forwarded.*]

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A. P. Lathrop, Secretary Ohio Gas Light Association, Columbus, O.—

Dear Sir: In accordance with the resolution adopted at the Eleventh Annual Meeting of the Ohio Gas Light Association, we give below such figures and facts regarding the installation of the Welsbach lamps as will be of benefit to the Association. In making this report it is with the distinct understanding that our name shall be kept entirely confidential.

Report for Month of.....189..

Number of Welsbach Lamps Installed this Month.	Number Displacing Open Gas Flame.	Number Displacing Incandescent Electric Lights.	Number Displacing Arc Electric Lights.	Number Displacing Coal Oil.	Gain or Loss in Sales for the Month, in Consequence of Use of Welsbach Lamps.	Total Number of Lamps in Use.	Number of Mantles Used During the Month for Renewals.	Number of Chimneys Used During the Month for Renewals.	Make of Chimney Used.	Remarks.

Yours respectfully, ...

BRIEFLY TOLD.

MAYOR STRONG AND HIS OBJECTIONS TO THE WRAY CONTRACT BILL.—Our issue for April 29th contains the text of the bill introduced in the Assembly by Mr. Albert A. Wray, of the 15th Kings District, which had for its object the enabling of the authorities of cities of the "first class" in this State to enter into contracts with companies supplying gas or electricity for light, heat or power purposes, in such cities, for a term of 15 years, provided such companies conceded to the authorities the establishing of a progressively lower rate for the said supply during the continuance of the contracts. The cities affected by the proposed act were New York, Brooklyn and Buffalo, since these only contained the population requisite to entitle them to be known as cities of the first class. We have to admit, of course, that the text of the bill, although its title seems to cause it to be equally applicable to gas and electric lighting supply, makes it far more binding and relatable to gas than to electric companies; but whether it applies with greater force to the one

than to the other has no real significance to the public. What the latter desires is cheaper service, and as by far the greater caterer to its needs is the gas interest, the cheapening to it of the latter's product is that which the public would most welcome. The Wray bill permits—yes, to be effective and legal, declares—this result, and a desirable result it undoubtedly is. Under the new constitution (the odd and irreconcilable features of which reflect the queer temperaments of the strange fish that were hauled in when the delegates to the constitutional convention were seined at that notable election) the Mayors of cities have the right to look over any measure passed by the Legislature affecting the interests of the cities over which they preside, and so it happened that Mr. Wray's bill came for examination to the Mayors of New York, Brooklyn and Buffalo. The Mayors of the two last named cities returned the measure to Governor Morton with their unqualified approval; but Mr. Strong, whose knowledge of how to shear sheep and to card wool is vastly greater than is his capacity to direct the affairs of the first city of the Union, informed Governor Morton that he could not assent to the provisions of a measure securing to the Metropolis cheaper gas and cheaper electric light. Even a wool-seller must have some consideration for those who are obliged to wear cotton, and so we must look to the record for a possible cause of his objection. Can that reason be found in this? Some time ago Mr. Strong was one of the promoters of the Brush Electric Light Company for New York city—in fact, we think he was its President for some years; and the history of that unfortunate enterprise, so far as its holders of common stock are concerned, is a woeful one. One friend of ours, who put $10,000 in the "enterprise" at the time when Strong and associates were promoting the thing, subsequently disposed of his holding for less than $2,700—and it was the best sale our friend ever made. In fact, the common stock at less than 27 was very dear considering what it sold at subsequently. Putting Mr. Strong's experience in the artificial lighting field against his action in disapproving the Wray measures, we imagine he is still afraid of gas, since he evidently knows that if the gas interests, through the medium of such a bill as the Wray measure, are protected from opposition franchises and legislative strikes, the wretched little bit of profit which the electric lighting companies of this city are at present making, under their ruling high rates and abortive service, would be completely wiped out.

NOTES.—Mr. Charles P. Greenough informs us that he has resumed the general practice of his profession, with headquarters at No. 39 Court street, Boston, Mass. Any gas company in the country which desires to secure at any time the services of a capable lawyer—a lawyer of merit and one who believes the interest of his client to be paramount at all times—will make no mistake is dealing with Mr. Greenough.——To-day Mr. and Mrs. B. A. Ward, of Michigan City, Ind., celebrate the 15th anniversary of their marriage. May their future be as harmonious as their past experience in the united state.——We regret to report the death of Mr. Charles A. Stanley, a son of Mr. Ira N. Stanley, of Brooklyn, N. Y., who passed away in the Presbyterian Hospital, Chicago, Ills., on the 4th inst. He succumbed to an operation for appendicitis. ——The Council of Syracuse, N.Y., has granted to ex-Senator Hiscock and his band a franchise to manufacture and sell gas in the city of Syracuse, N. Y. It will not be worth anything to them for purposes of barter and sale, as Mr. Wood's Company is selling gas at a very reasonable rate.

Correspondence

[The JOURNAL is not responsible for the opinions expressed by correspondents.]

A Correction.

GENERAL OFFICES, INTERNATIONAL COOLING CO., NEW YORK, June 6, 1895.

To the Editor AMERICAN GAS LIGHT JOURNAL: From your issue of June 3d we quote as follows: "The new refrigerating plant for the International Cooling Company, at Atlantic City, N. J., will be designed and built throughout by the Berlin Iron Bridge Company, of East Berlin, Conn."

We have to correct this statement by saying that the Berlin Iron Bridge Company has nothing to do with the *refrigerating plant*, and is simply the erecter of the building for our central station under contract with us.

Yours, respectfully,

INTERNATIONAL COOLING CO., by
DAVID BRANSON, Pres.

[OFFICIAL REPORT.—REVISED BY THE SECRETARY.—CONTINUED FROM PAGE 811.]

EIGHTEENTH ANNUAL MEETING, WESTERN GAS ASSOCIATION.

HELD AT PITTSBURGH, PA., May 15, 16 and 17, 1895.

SECOND DAY—MORNING SESSION—MAY 16.

REPORT OF COMMITTEE ON NOMINATION OF OFFICERS.

Mr. J. B. Howard, from the Committee on Nomination of Officers, reported the following-named gentlemen to hold office for the terms designated by the laws governing the Association:

President—A. W. Littleton, Quincy, Ills.
First Vice-President—W. H. Odiorne, Springfield, Ills.
Second Vice-President—S. M. Highlands, Clinton, Iowa.
Secretary and Treasurer—J. W. Dunbar, New Albany, Ind.
Board of Directors—Wm. McDonald,* Geo. T. Thompson,* Irvin Butterworth,* Wm. M. Eaton,* Geo. H. Harper, Peter Young, O. O. Thwing and Wm. Steinwedell.

ELECTION OF OFFICERS.

On motion of Mr. E. H. Jenkins the report was adopted, and Mr. J. B. Howard was instructed to cast the ballot of the Association in favor of the election of the nominees. Mr. Howard having reported the unanimous election of the gentlemen named, the Chairman called upon the President-elect (Mr. Littleton) to say a word or two. Mr. Littleton responded as follows:

Mr. President and Gentlemen: It is simply impossible for me to tell you how deeply I appreciate the honor you have conferred upon me in electing me President of this Association. I greatly question the wisdom of your choice, but since it *is* your choice, I can only say that I accept the office—although very reluctantly, and with many misgivings as to my fitness for the place; but I shall certainly try to perform the duties thereof to the very best of my ability. (Applause.)

ELECTION OF NEW MEMBERS.

Mr. William McDonald, on behalf of Committee on Applications for Membership, recommended the following-named gentlemen as eligible for membership in the Association:

Active.

Addicks, W. R., Boston, Mass.	Lane, F. K., Chicago, Ills.
Blinks, W. M., Michigan City, Ind.	McAdams, B., Michigan City, Ind.
Byers, C. A., Haverford, Pa.	McIlhenny, J. D., Phila., Pa.
Jones, T. C., Delaware, Ohio.	Seamon, J. F., Uniontown, Pa.
Kuehn, J. L., York, Pa.	Whysall. G. H., Dayton, O.

Associate.

Collins, D. J., Chicago, Ills.	Mansur, J. H., Royersford, Pa.
Ellsworth, F. O., Chicago, Ills.	Mordue, T. N., New York City.
Henderson, E. H., Pittsburgh, Pa.	Slocum, F. L., Pittsburgh, Pa.
Kirby, H. C., Cleveland, O.	Whirl, J. J., Chicago, Ills.
Macfarlane, G., Louisville, Ky.	Woods, S., Pittsburgh, Pa.

On motion of Mr. Gwynn the report of the Committee was accepted, and Mr. McDonald was instructed to cast the ballot of the Association for the election of the applicants. He did so, and when they were declared duly elected to membership, those present arose and were introduced by the President to the Association.

NAMING THE NEXT PLACE OF MEETING.

The President—Next in order will be the report of the Committee on Place for Next Meeting, of which Mr. Cowdery is Chairman.

Mr. Cowdery—Your Committee have had much difficulty in coming to a conclusion, for we realized there was a desire among the members to go to some new place, with a decided leaning toward the naming of some Southern city. The field was canvassed quite thoroughly, and the claims of Indianapolis, St. Louis, Minneapolis, Nashville, Chattanooga, New Orleans and Atlanta were carefully considered. After covering the ground very thoroughly as to location, facilities for transportation, hotel accommodations, etc., the Committee concluded, in order to meet the wishes of all the members, to recommend to the Association the selection of either Chattanooga, Tenn., or St. Louis, Mo.

Mr. Lansden moved that the Association name St. Louis, and Mr. Thompson seconded it.

Mr. Clark—I move to amend by substituting Chattanooga for St. Louis; seconded by Mr. Miller. The President then announced that the amendment was open for discussion.

* To serve for one year.

Mr. Shelton—I think a trip South would be most enjoyable by this Association. We have met many times in St. Louis, in one capacity and another, either with the American or Western Association. Knowing, as we do, the hospitality of St. Louis, I need not add a word on that point, for we know that we will be royally taken care of if we go to that city; but, at the same time, we are rather given to going over a certain line—circulating between Chicago, St. Louis and Cincinnati—very regularly. I think every man who attended the Savannah meeting of the American Association, in the fall of 1890, will remember the pleasure and the novelty enjoyed in going through a country somewhat new to us. I think Chattanooga is not so far off but that a very fair attendance could be had at that point. Many attractions are to be found there, and there will be a great many matters of interest connected with meeting in a city out of the usual line. I have no doubt the gentlemen in that place would give us a hearty welcome. I would like to hear further discussion and further advocacy of meeting in Chattanooga. I should think the hotel accommodations there would be reasonably good; but I would be very well satisfied to leave that with the Committee of Arrangements. I hope we may have a full discussion of the matter.

Mr. Lansden—The name of our Society is the Western Gas Association. We see and rejoice at the number we have here who never were West. They come this far, and believe they are in the West on coming to Pittsburgh. This Association has not had a meeting in St. Louis for seven years; and, therefore, to a large element of our Society St. Louis is almost unknown. As far as my personal feelings are concerned, I would prefer going to Chattanooga; but I am desirous of doing what is for the best interest of the Western Association. I think one great benefit we have is to at least have most of our members meet with us once in every two or three years. A certain representation of the small works of the West cannot get away if they have no excuse to go; and if they go they have to pay their own expenses. When we meet in large cities such as Chicago, St. Louis, or Cincinnati, the superintendents of small works can often have an excuse for going, when perhaps their Directors would not let them go under any other circumstances. They can go there to make purchases or to look after machinery. I think it is to the interest of this Association to go West next year—or comparatively West—for St. Louis is really East.

Mr. Clark—I understand thoroughly that the name of this Association is the "Western" Gas Association; but still I was considered eligible for membership therein when I lived in New Orleans, and Chattanooga is nearer St. Louis than New Orleans is. There are many members from the South who are entitled, it seems to me, to have the meetings occasionally come nearer to them. I do not know what the hotel accommodations at Chattanooga may be, but I know that they cannot be worse than they were at St. Louis headquarters the last time the Association met there. The city of Chattanooga, and the country all around it as well, cannot fail to interest you. Not only is it a very beautiful country, but it is a region of great historic interest. Mr. Lansden is in error as to the last time this Association met in St. Louis. We were there in 1890. There seems to me every reason why we should now go to Chattanooga—if the hotel accommodations are all right, and I understand they are, but would not be sure on that point; probably there are some here who do know about that. There is no special reason for going to St. Louis, except that St. Louis gas men have always treated us admirably.

Mr. Cowdery—Your Committee inquired as to the hotel accommodations at Chattanooga and learned that they were ample to take care of this Association. The hotel on Lookout Mountain has about 500 rooms, and with that number could easily take care of this Association. The hotel is well run, and no doubt would meet all our requirements. It is located on the top of Lookout Mountain, about two miles in a straight line from Chattanooga, or about seven miles by the railroad. Trains run up the mountain regularly and at short intervals, so that those who want city entertainments can easily reach the city, and go back and forth readily whenever they wish.

The President—We would like to hear from Mr. Forbes, of Chattanooga.

Mr. Forbes—I am afraid the hotel accommodations are not sufficient. The hotel is on the top of the mountain, and too far from the town.

The President put the question on the amendment and declared it carried.

Mr. Jenkins—I think we ought to say to Mr. Forbes, and to his Company, that we are going to Chattanooga on our own responsibility. I can understand Mr. Forbes' position very thoroughly; and we want it understood that in going to Chattanooga we go without any invitation, and that we shall expect to take care of ourselves. (Applause.)

The President—That is the understanding of all the members, I believe.

Mr. Shelton—I understand that the best hotel there is on top of Lookout Mountain, and I suggest that that would be the most attractive place for the meeting. There is no absolute reason why we should hold our conventions in a city as long as we have accommodations for sleeping and eating and a good meeting room. It seems to me if we can meet our needs in such respects on top of the mountain, in that warmer section and time of year, the hotel on top of Lookout Mountain would make a most delightful place for the meeting. I suggest that the Committee of Arrangements be instructed to very carefully consider that hotel in selecting the place for the meeting.

Mr. Miller—I would suggest, if you go up there in May, you will see to it that you take your overcoats along.

Report of Committee on Federation.

The President—Is the Committee on Federation ready to report?

Mr. Ramsdell, of the Committee, read the following report, which was, on motion of Mr. Jenkins, adopted:

Pittsburgh, May 15, 1895.

To the Western Gas Association: Gentlemen—Your Committee, to whom the subject of Federation was referred, beg leave to submit the following report:

1. The American Association (with whom the matter originated), at its meeting in Washington, October last, by a negative vote stamped it with its disapproval.

2. Your Committee consider the tendency of the times in the gas world to be in the contrary direction. The remarable display of vicious legislation in many States during the present year seems to demand local combination such as State Associations or State Gas Commissions in order to effectually combat the various forms of pernicious politics.

3. A careful examination of the records fails to show that any Association thus far has indorsed this matter with its approval, or by its vote expressed a desire that a federation be formed.

4. Your Committee, therefore, conclude that, in its present form and at the present time, the subject of federation, while having many good features, is still impracticable; and we, therefore, respectfully recommend that further consideration of the subject of federation be indefinitely postponed. Respectfully submitted,

Geo. G. Ramsdell,
A. W. Littleton,
B. E. Chollar,
} Committee.

The President—We will now listen to the paper by Mr. D. J. Collins, of Chicago, on

THE STORAGE AND HANDLING OF OILS IN A GAS WORKS.

The rapid growth of water gas, and the limited use of other processes, which require oil in their manufacture, necessitating its storage in proper manner and considerable quantities, make the consideration of this question of much importance to those interested in the practical management of gas works. Many conditions must be taken into account. It is the aim of this paper to treat them only in a general manner, with the idea of gathering together and possibly suggesting the major portion of desirable or essential points to be borne in mind by those who are likely to become users of oil, as well as those who are already interested. The paper[1] read by Mr. W. E. McKay at the New England Association of Gas Engineers, in Boston, February 21, 1894, so ably and fully covers the construction proper of oil tanks and the measurement proper of oil, that I think it needless to go over such part of the subject again. A general disclaimer herein is made of all tables and equations, for, without decrying the value of such one particle, the object of this paper is rather to cover what are commonly called the "practical" points that are first thought of by those who contemplate the use of oils in gas making. Mr. McKay's paper, an excellent one, in its purpose is more especially applicable to the larger companies. This paper is more for the smaller and medium sized companies.

Crude Oil and Naphtha.—Whether crude oil or naphtha is used, the same consideration and precautions should prevail, for while there is undoubtedly less danger in working with crude oil than with the more volatile naphtha, and less current loss by evaporation, etc., crude oil in bulk is nevertheless a highly inflammable substance, requiring due precaution regularly maintained to secure practical safety. As the two materials (crude oil and naphtha) give about the same results in economy in the better class of apparatus, and are used largely and indiscriminately by gas companies according to which is offered the cheapest, they will in this paper be considered, as far as handling, etc., goes, as simply "oils," the points made applying in the main to either one.

Tanks.—*Form.*—The first question which arises is the best form of

1. See Journal, March 13, 1894, p. 363.

tank to be adopted. This depends largely on the size of the works, the nature of the ground where the tank is to be located, the climatic conditions existing, and cost. In many cases the horizontal cylindrical form is all-sufficient, and sometimes the best. The cost of construction is usually less than the upright or cheese-box form, on account of the ability to ship complete by flat car from points where tanks are built. An objection to the horizontal tank, however, is that by reason of its proportions, unless extreme care is observed in unloading and placing on the foundation, the seams are liable to be strained and leaks caused. Another objection is that unless one has carefully worked out an accurate table of capacities for each half-inch in depth, etc., it is difficult, in horizontal cylinder tanks, to take correct account of stock of oil on hand, for, owing to the cross section of the tank "falling away," each half-inch of vertical depth does not mean the same number of cubic inches as in the cheesebox form, but a different number. As a rule, and especially in the larger works, the vertical cheese-box form is the best, by reason of the simplicity of measurement and the greater economy of space secured. Whichever form is used, the tank should be made gas tight as well as oil tight.

Water Top.—Under some circumstances tanks are built with a water top; this provides for a few inches of water to be kept on the top of the tank to keep the head at a nearly uniform temperature and thus minimize evaporation by lessening the contraction and expansion, and hence the starting of joints and leaks. Manholes should be provided on either form of tank, both on the top and on the side near the bottom. Those in the latter location are used in clearing out any sediment or "B. S." which may accumulate.

Quality.—In ordering oil tanks especially it is wise and economical in the long run to buy from some concern who thoroughly understand tank construction, and not on the cheapest prices irrespective of merit. Low cost in oil tanks, as well as in any gas works construction, may mean "skinned" work, a chronically leaky tank, and a long series of trouble. On oil tanks, for paint, use good asphaltum or plumbago makes.

Vents.—All tanks must have an air vent at the top to prevent a vacuum and undue pressure when emptying and filling respectively, and also to allow any evaporation to pass off, preventing accumulation of vapors on the inside of tank. Such a vent should connect by pipe to the inlet to the gasholder and not into the air; an open vent permits of odors and is a possible source of danger, and perhaps loss of oil as well. Any oil vapor which passes over by evaporation is carried into the inlet of holder and may be saved.

Setting.—The horizontal form of tank may be set either above or below the ground level; the latter plan, on sills, is the more common practice on account of general ease of access. In setting this kind of tank underground it should never be buried in the earth and access to it at all points so prevented. It may settle, and 5 or 10 per cent. of oil leak a year undetected. It should be placed in a pit sufficiently large to allow passage around the tank, and this pit should be laid up with a retaining wall of brick or stone so that no earth is brought into contact with the surface of the iron or steel, as rusting of the joints is apt to result and leaks follow. The cheesebox form of tank may be carried on any good concrete foundation, levelled off true. The tank should be entirely exposed to view.

Foundations.—The very best foundation construction is probably as follows: There should be built an outer ring of solid brick or stone work, of sufficient thickness to safely carry the weight of the tank filled with oil, with radial cross walls carried through like spokes in the center of the circle. On the top of these walls I-beams or railroad iron should be placed for the proper supporting of the bottom sheets, these beams being set flush with the top of the walls. Drain pipes should be provided to keep all dry. At several points in the outer and cross walls, openings should be left large enough for a man to pass through, thus allowing the bottom of tank to be gotten at in cases of necessity. While this is probably an expensive setting, it is a superior one. Large sized tanks should be set on good solid, level foundations, so constructed that in case of settlement all parts will settle alike.

Pits.—As a general maxim it is safer, and hence preferable, to set oil tanks in a pit, as in that case, in the event of a possible rupture of the tank from any cause, the oil is held at that point and cannot flow over the premises. A low bank of earth concentric with the tank will answer the same purposes often when above ground, and is inexpensive.

Shelter.—Where possible all tanks should be provided with some shelter for protection from the rays of the sun in summer and from the snows of winter. This shelter should not be built of wood, but be made as nearly of fireproof material as possible. Corrugated iron will be found satisfactory.

Steam.—In the colder portions of the country, for tanks in which crude oils or heavy distillates are liable to be stored, a good plan is to place in the bottom of the tank, on the inside, a coil of pipe connected with the steam plant; by this means it is a very easy matter to keep the oil in condition to flow. Trouble from sluggish flow is not often experienced, but as at times it is desirable (during the periods of speculative manipulation of the prices of naphtha and crude oil to a temporary high figure), to turn to the use of cheaper "distillates," "intermediates" and "heavy" oils, it is well to have all devices for their easy handling.

Isolation.—It is not essential in locating the tanks to isolate them from buildings, although it is probably a better and safer plan to do so to a reasonable extent, as with the best of care gross carelessness may occur on the part of some employee in conjunction with a light.

Stock.—The question of the amount of oil necessary to keep on hand is decidedly important. In works of small and menium size, plan for at least 60 days' supply always on hand. In larger plants, having more regular shipments, 30 days' supply should be kept on hand. By having ample supply to depend upon, all danger is practically eliminated of shortage which might result from delays in shipment, railroad strikes, or other causes. It also provides somewhat against unusual and temporary fluctuations in the oil market when not working under contract by the year. The tank should always be kept full and shipments arranged to come along regularly having this end in view. This is a matter that can be easily systematized and accomplished when once properly started.

HANDLING.—*Pipe Lines.*—Pipe lines from the unloading point to the works should of course be carefully laid, and preferably in a tight box, or through a condemned gas main. Drip pipes connected to this main and conducted to a central point will indicate any leakage which may occur. The oil pipes in and around the tanks and works should all be exposed, either in an open trench or above ground, so that the joints can be seen and any possible leak quickly discovered and remedied.

Size.—The main discharge pipe from the tank car to the tank should be of threaded iron pipe, and at least not less than 2 inches in diameter—2½ or 3 inches is better. All joints should be made with a good plumbago grease. There are several makes on the market. When this cannot be had a good turpentine soap used by itself will make tight joints. All joints should be well screwed into place, great care being observed that all threads are perfect before laying; this is very important.

Coating.—Any wrought iron pipes that may be laid in the ground should be well coated to prevent rusting, as, in the case of services, if for no other reason, if coated and preserved, these pipes can then be used at any future time for any other purpose without danger if taken up.

Bends.—Do not use elbows or T's in the main pipe lines unless unavoidable. The sharp turns cause friction and retard the easy flow of the oil. Only easy bends or "springs" made of the pipe itself should be used. Whether oils are handled by gravity or pump, air or water pressure, an easy, natural flow means a saving of time and expense. A minimum of sharp turns saves friction and conduces to this. Before using any pipe it is very essential that it should be thoroughly tested to prove its tightness. This can be easily done by filling the pipe with water, and the use of a pressure pump and gauge.

Gravity Unloading.—Where the lay of the land permits (that is, where the railroad tracks are at a higher level than the storage tank) oil cars can be and usually are emptied by gravity. The main unloading pipe should never be carried under the rails of the track, but be stopped a few feet distant from them, and connection made with the valve under the car by means of hose.

Pumping.—Unloading by gravity is convenient and lazy; a better and safer plan is to pump, and arrangements should be made in all cases to do so where possible. It is easily done by having a connecting pipe carried up to, over and down through the dome on top of the tank car. In the event of any trouble occurring with the valve under the car, or of water in the oil settling out in transit, or freezing at that point, it is almost essential. Some oil companies state that all cars should be unloaded by the overhead pumping plan, claiming that the valve below is placed there simply for convenience in cleaning the car, and should only be used for that purpose. Their position is taken so as to avoid liability for damages in case of any accident or loss of oil which might result in unloading through the bottom of the car.

Track Box.—A very good arrangement at the track where the car is unloaded is to inclose the pipe riser in a wooden box made of 2-inch plank; this box should be made with a hinged cover, and when not in use it should be strongly padlocked. This will prevent small boys or

others bent on mischief from filling the pipe with pebbles, stones or other foreign matter.

Unloading Hose.—The coupling for making connection to the bottom of the tank car must be of special design and pattern, as the thread on the tank car is a 4-inch special, having but four threads to the inch. The hose may be made of rubber on a flexible wire frame, and should be about 8 or 10 ft. long, and complete with special tank car coupling at one end and standard pipe thread fitting at the other. It should be removed and stored, free from kinks, in the gas works when not in use. Theoretically, a pump will lift water about 34 feet; practically, about 28 feet. On account of its greater volatile properties, oil cannot be raised this distance. It is not safe practice to set the tank pump so that it will have to lift to exceed 22 feet vertically.

Ice in Car.—Occasionally in winter a car of oil is received in which the water from the oil settles around the outlet valve and freezes, and, unless rigged to pump out from the top, as above, it will be necessary to provide some means for thawing the ice. A good plan to adopt, if the distance from the works is not too great, is to carry a small steam pipe from the boiler through the oil pipe to the track, and by the medium of a hose the steam from this can be utilized in opening up the stoppage by a coil or return bend of pipe lowered through the dome. For long distances, either a portable boiler can be used or crude oil can be moderately heated at the works and carried to the car in barrels and brought into contact with the ice through a pipe placed through the manhole on the dome, with the lower end against the ice in the bottom of the tank. This method, I understand, has been used with success by Mr. McKay. Troubles of this kind occur but seldom, but as long as they do occur it is well to be prepared to meet the emergency.

Samples.—Each car of oil when received, and before it is emptied, should be roughly checked or tested; oil companies, either by accident or otherwise, sometimes send "doctored" oils. A gallon jar of the oil should be taken from each car, labeled and dated, and kept until all chance of dispute has disappeared; this sample oil can be later analyzed in the event of necessity arising. In addition to this test, every gas company should have a hydrometer and test to see that the gravity of the oil received is according to contract. These hydrometers can be obtained from any good instrument maker, such as Queen & Co., of Philadelphia, and cost about $3. If the oil is not received as ordered, by having kept samples and made these tests, the companies are in shape to make a just claim for rebate.

Car Capacities.—All gas works using oil should be provided with a copy of the "Tank Gauge Hand Book, No. 2." This can be had from the Central Traffic Association, The Rookery, Chicago. This hand book contains the capacity of every tank car in use for hauling oil in the United States. In addition to this book the Association should be asked to send all supplements that may be issued. When a car is received, by consulting this hand book and comparing the quantity given therein with the bill it can readily be ascertained if there is any mistake made in amounts. A tank car is considered full when the oil enters the bottom of the dome on top of the car. It is not intended to fill the dome. If the car is not full it should not be unloaded until the shipper has acknowledged the shortage.

Temperature.—In taking account of the oil in the main storage tank, the measurement in gallons should always be corrected for temperature. Oil increases in bulk 1 per cent. for each 20° above 60° F., and decreases 1 per cent. for each 20° below 60° F.

Engine Sparks.—Frequently the gas company's switch where the oil is unloaded is close to other tracks, and engines in passing are liable to throw out sparks which may be dangerous. To prevent trouble by fire from this cause, a sheet iron cap should be provided and placed over the dome of the car when unloading. This cap should not fit tightly, but be rather in the form of a "bonnet" or inverted loose can, so as to allow for the admission of air to replace the oil as it flows from the car.

Piping Tanks.—In piping storage tanks of any form carry the inlet or filling pipe through the top of the tank, extending it down to the bottom. Make the lower end of this pipe U-shaped, or by a return bend extend it up again about 12 inches from the bottom. This will allow the oil to run in without stirring up the sediment which may be in the bottom of the tank. The outlet pipe should be arranged in the same manner, thus preventing drawing out the sediment or water. A separate pipe should be provided for the latter purpose. This latter pipe should also be carried down through the tank top and should end close to the bottom. Sediment pumped out through it may be used with the boiler fuel. All pipes should enter the tank through the top. No connections should be made at any other place.

Measuring.—Although it is preferable to use a meter in measuring the oil at the works, for the reason that a continuous registration is had, essential for checking the gas maker in the amount of oil used, yet, as the meter may at times vary, a small tank of known capacity should be used for testing the meter by comparison at least every week. The piping should be so arranged that the oil can be pumped from the small tank through the meter on its way to the apparatus. In all cases a wire strainer should be placed between the pump and the meter, to prevent foreign substances getting into the meter. For further points on piping and measurement, I again refer you to Mr. McKay's paper.

Lights.—It is not considered good practice to carry lanterns or lights around the oil tanks, nor to look for leaks except with daylight; pyrotechnic and serious results may follow. Oil is a good servant but a bad master. With reasonable care it is practically entirely safe. With carelessness the combination of oil vapors and air contains much power for damage. Witness this instance, wherein a recent dispatch through the Associated Press conveys some idea of the consequence of bringing a light and oil or oil vapors together—two men with a lighted candle went into the tanks to clean them:

"San Francisco, Cal., March 8.—A terrific explosion on the tank of the steamer Bawnmore, lying at the Artic Oil Works dock, at the Potrero, caused great excitement in that section of the city to-day. Two men were terribly bruised and burned, receiving what are thought to be mortal injuries, and the vessel was badly strained. Everything on board was thrown into the greatest confusion. The Bawnmore recently arrived from Peru with a cago of crude petroleum consigned to J. W. Grace & Co. The cargo having been discharged, two workmen carrying a candle went into the tanks this afternoon to clean them out. Instantly an explosion came, shaking the steamer from stem to stern, twisting the tanks out of position and smashing the surrounding woodwork. The two workmen were carried out in an insensible condition."—Chicago *Inter-Ocean.*

A strict rule that should be maintained absolute under all circumstances is to allow no lights or smoking anywhere near the tank; any employee disobeying this rule should be discharged at once. If modern fire extinguishers are kept in the works, have some handy to the oil pumps, valves, piping and spots where oil may be spilled.

Tank Wagons.—While oil pipe lines may be a mile in length if necessary, in certain localities the gas works are so situated that it is impracticable to lay an oil pipe to the works from the railroad; in this case a tank wagon furnishes an excellent substitute for the pipe and is perfectly feasible. A double horse team rig of running gear and tank of 600 or 800 gallons capacity complete will cost in the neighborhood of from $300 to $400. At a point near New York city I understand that with this method in use a haul of 3 miles adds only about one-half of a cent per gallon to the cost. Taking as a basis the well determined figures that 2 tons, or 4,000 pounds of good gas coal will yield 20,000 cubic feet 17-candle power coal gas, and that a ton of oil and a ton of anthracite together, or 4,000 pounds, will easily produce 50,000 cubic feet of a better candle power water gas in a modern setting, it can be readily seen that the hauling of oil in tank wagons is entirely practicable and cheaper per 1,000 of gas to be made than to continue to haul the materials for coal gas manufacture. Gas companies situated away from a railroad certainly need not be deterred from adopting water gas on account of distance from the tracks. In using tank wagons, it is of course, if possible, best to arrange to drive directly under the tank car for easy loading. Arrangements can usually be made with some local coal yard for the use of their trestle, especially if you should buy your anthracite or boiler coal there.

The sundry points noted herein are sufficient for most practical purposes, but in now committing this paper to the tender mercies of your discussion additional desirable points can be brought out I am sure, and I trust will be.

Discussion.

The President—This interesting paper contains a great deal of valuable information. Mr. Collins will be pleased to answer any questions.

Mr. Humphreys—Mr. Collins has given us quite a number of very valuable suggestions in a very practical shape. I would like to ask him as to one or two points, and especially to raise a word of warning. My first reference is to what he says about horizontal tanks (on page 2), that the cost of construction is usually less for horizontal tanks than for the upright or cheese-box form. I think Mr. Collins has fallen into an error there. That statement may possibly be true with respect to very small upright tanks, but as you increase in size the cheese-box form is very much cheaper. It is a question in my mind whether it is good practice, simply for the sake of the extra convenience on a very few occasions, to put a manhole plate on the side of the tank. You can clean it out from above. You very seldom have to clean it out; certainly not more than once a year. You do introduce a slight extra

risk by having any bolted joint on the side of the tank. I am inclined to think that the better practice would be to leave off the manhole at the side. As to the vents: If anybody contemplates connecting the tops of their oil tanks with their coal gas supply, I would advise them to first thoroughly investigate the subject. If you do make this connection you must see to it that you do not carry over a large amount of vapor from the top of your tank to your gas mains. I have known of works in quite large cities where the manufacturing records were thrown out of adjustment altogether by this carrying over of vapor from the oil tank. The worst case I know of was an unprotected tank, exposed to the sun in the open air, and storing naphtha. Therefore, if you contemplate anything of that kind, be very careful where you place and how you build the tank. In no case would I recommend that such a connection be made if you are going to use naphtha. Referring to the question of piping to the tank: Before you decide to put in a suction pipe through the top (and I am very much in favor of having all connections at the top if possible) see whether you can lift the oil the required height. There are some tanks in this country which are deep enough to absolutely prevent it; and especially in view of the "trapping" of vapor. You cannot give too much attention to the danger of fire. I suppose a large majority of the oil fires that have occurred in water gas plants in this country in the last ten years have come, not from the tanks but from the connections, and perhaps a large proportion of those have been right in the generator house; and a large proportion of those again have occurred in the first instance in a very small way, so that if they had had instant means of relief the fire would have been prevented. Water in that case is very often valueless. It simply washes the fire around. A very good and safe measure is to have dry sand in such a form and place that you can get at it instantly—as in a box reserved for that purpose, where the sand can be kept clean and dry—with a convenient scoop; and have it understood that it is a sufficient reason for the discharge of the employee responsible if that sand is used for any other purpose—just as it should be in the case of a fire bucket. It is astonishing how quickly fire can be put out by the prompt application of a little dry sand.

Mr. Thompson—By a coincidence the "Wrinkle Department" contains an item concerning the unloading of tank-cars almost identical with two of Mr. Collins' suggestions. I desire to express my hearty agreement with his suggestions, especially as regards having the tank built by a firm which thoroughly understands the work—as to laying pipe-lines in tight mains—as to venting tanks into holders—and as to sampling car shipments. We have been using naphtha almost without interruption for a number of years, and for nine years in my own experience we have had our tanks vent into the gas holders, and have had no difficulty whatever. Mr. Collins speaks of transferring oil in tank wagons if railroad facilities are lacking at the works. It might be suggested that such wagons are very desirable for handling the drip-condensation; and the same wagon may be used for both purposes. In St. Louis we rather reverse this arrangement, in having a *drip-wagon* which we occasionally use for transporting oil from the larger plant to our Pintsch works. I would add one point to those made by the paper. I think it quite desirable to have a quick opening valve controlling the entire oil supply to the generator house, in order that the danger may be minimized in case of an accident to the gauges in the supply tanks. On page 8 the statement is made that in piping storage tanks the pipe should enter the tank through the top. I would ask Mr. Collins whether he would not modify that statement in case the tanks are 22 feet in height, or where it is impracticable to pump oil that distance?

Mr. A. S. Miller—If a large steam pipe is put into the tank it may sometimes save trouble in case of fire, because burning oil can be very easily extinguished in a closed vessel by the use of steam. In respect to the connection of measurements for temperature, I would like to ask Mr. Collins if 1 per cent. for each 20° above 60° F. is the absolute expansion of oil, or whether it is the differential expansion in the iron tanks. Of course the expansion of oil in iron tanks would be differential expansion; and so it would not be fair to subtract 1 per cent. in case the temperature of the oil in the iron tank were 20° above 60° F. I would like to know from him what the differential expansion would be.

Mr. Collins—I am unable to state just what the differential expansion would be. The correction for temperature given is approximately correct. Replying to Mr. Humphreys and Mr. Thompson: I think their suggestions are good; but, as I stated originally, this paper was more particularly intended to apply to small or medium sized works, while the most of Mr. Humphreys' remarks related to works of larger size. For small works I think the horizontal form of construction of small tanks is less expensive than the cheese-box form. His suggestion as to the use of sand for extinguishing slight oil fires is good, but I think that a properly working fire extinguisher can also successfully handle small fires.

Mr. Humphreys—I have to take issue quite decidedly with Mr. Thompson on the question of venting. I would like to have him explain in detail how that tank of his is arranged. I can hardly understand how they can have used that arrangement for nine years without finding that a large amount of vapor has gone away. Has he not found a shortage in the oil tanks? Has he not found that the results generally failed to check up? Is it a covered tank?

Mr. Thompson—During the greater part of the nine years the tanks we had in use for storing naphtha were at a portion of the works quite remote from the outlet main to the street, and the pipes had to be carried through the top of the tank and connected with the gas supply pipe between the storage house and the blacksmith shop. Then a 2-inch wrought iron pipe was carried to the distant outlet main, 400 feet away, and any condensation above the quantity which you would ordinarily expect to find in an exposed gas supply pipe was removed at the nearest drip from this gas supply pipe, say at a convenient lamp bracket at the corner of the storage shed. We have never had any undue quantity of condensation. In our large tank lately erected we vent directly into the inlet pipe into one of our holders, with a drip midway between.

Mr. Odiorne—I have had an experience of that kind. We connected a vent pipe with the holder inlet, or at a service pipe from the holder inlet, extending down through the gas house yard to a couple of houses below, occupied by men who worked for the gas company. It being so handy, we connected it right on to that service. We found after a while that these men complained that the gas did not burn well. We investigated it and found that the vapor was carried over there, and that the gas gave them very little light at all. It did all right with a Welsbach burner, but with an ordinary burner it gave scarcely any light. We had to abandon that plan.

Mr. Shelton—I think it is not intended that the figure of contraction and expansion under changes of temperature (which is given by Mr. Collins as at about 1 per cent. for each 20° above or below 60°) shall be taken as an arbitrary figure; but that, roughly speaking, and under the conditions referred to, the degree of expansion is about 1 per cent. for each 20°. I think if there are any oil people here they may be able to state definitely the ratio of expansion. In the last page of his paper, Mr. Collins refers to the fact that the cost of hauling oil in a tank wagon a distance of three miles is about half a cent per gallon; but in conversation with the manager of the place in question this morning, I find that the cost is only about a quarter of a cent per gallon, which is a proper correction to be made in the discussion here.

Mr. Humphreys—I do not want to seem to be too persistent, but as the matter is very important, I would like to have Mr. Thompson answer the question about the way in which the oil is stored. Is it a covered tank, and was it equipped with a water top? Does he sprinkle the tank in very hot weather? We know that these light naphthas can be carried forward with the gas and carried out into the streets. We know there is such an apparatus devised and in regular use for the purpose of carbureting millions of feet of gas per day. The case I have particularly in mind is the works that Mr. Collins himself was Superintendent of. I do not know whether he was the Superintendent at that time, but I do know that the trouble was considered serious enough for me to go from Philadelphia to Omaha to look into it; for the quantity of vapor that had gone over had entirely upset our record of results. We were making apparently a fair gas from a low quantity of oil; but still that fair quality of gas, after it got to the streets, was smoking everything up, and blackening the street lamps. We made a long series of experiments as to the amount of vapor carried over into the gas main and found in that item the source of our oil shortage and the source of our excess of vapor in the gas. When the sun was on the tank, so rapidly was the vapor made that, with the vent closed, none of our ordinary pressure gauges were sufficient in length to measure the pressure created, and we were obliged to make gauges of extra length for the purpose.

Mr. Thompson—The two tanks which we have used the longest, and which are still in use, are under a covered shed. They have a capacity of about 17,000 gallons each. The third tank, and the largest, was erected in October, 1893, and has been in use during the last summer. It is a tank of the cheesebox form with a trussed crown and holds 107,000 gallons. There is no water top and we have used no form of sprinkling. It is in the open. I might add that we receive our oil under a standing order or arrangement by which the quantity in the tank seldom varies very greatly from day to day. The oil comes in almost the quantity used daily, so that there is no very great fluctuation in the quantity of vapor in the tank. There is a sufficient line of piping to connect it from

the tank to the holder, so that the gas pressure is constantly on oil in the tank. While I have made no tests of the amount of vapor passing between the tank and the holder, I do not consider it very great, because we have no oil condensation in the drips.

Mr. Clark—I want to call attention to the fact that Mr. Collins, while recommending a vent in the oil tank connecting with the gas main, also recommends that the tanks be covered. I cannot believe there would be any bad effect upon the gas in using the vent from the oil tank to the holder, if the oil tank is covered. We have quite recently decided to connect the vent on a tank of 300,000 capacity with our foul main, and have made careful calculations to determine the amount of evaporation we may get, and we are persuaded that the vapor will not have any observable effect upon the gas. I cannot believe there will be any material condensation of the vapor that goes off from the naphtha tank at atmospheric temperature; and, while drips will be provided, I anticipate there will be nothing in the drips from this connection between the tank and the main. It must be remembered that as oil is being used from the tanks the gas flows back into the tanks, of course discouraging evaporation to some extent. I thoroughly agree with Mr. Humphreys in recommending that sand be at hand to prevent fires, but I do not believe that sand would be sufficient in case of fire in the oil tank. It may be used to put out fire on the generator floor, but I doubt if the men would be willing to use it with the shovel in case of fire in the oil tank. I have had a talk with a man who has had a great deal of experience in extinguishing oil fires, and he tells me there need be no apprehension of any disaster from the tank if you can get steam into it quick enough after the fire starts. We are going to connect up our large tanks with the boiler, with a large connection from the main, so that we can throw into the tank all the steam that the boiler makes to stop a fire.

Mr. Humphreys—Connecting with the foul main and with the purified gas are quite different things. The former is the better practice. Let me suggest also that you may carry over lots of vapor and yet never find a show of it in the drip. And I did not expect to keep a sand box on the top of the tank from which to shovel sand into the tank in case of fire in the tank.

Mr. J. W. Stratton—I would like to inquire of Mr. Clark what effect the flow of steam would have in the closed naphtha tank?

Mr. Clark—I think the steam flowing into the top of the tank will condense first and then drive out through the vent whatever vapor, or mixture of vapor and air, may be in there, and that the steam will occupy its place. The capacity of the average oil tank of the cheese-box pattern is very much greater, many times greater, than that of a steam boiler. I should not fear to open the steam boiler into the top of a large oil tank and keep the fire going under the boiler. There would be a very rapid condensation in the tank, and there must be some vent in the tank which would take care of the steam under the pressure which would arise.

Mr. Shelton—What arrangement would Mr. Humphreys adopt in preference to venting into the inlet of the holder? What would he recommend as a standard arrangement?

Mr. Humphreys—I am not at all sure what I would recommend. I think that is the hardest nut to crack in connection with the storage of oil. If I were going to store heavy oil, and felt sure that, say, 90 per cent. of my oil was to be distillate, or other heavy oil, I would then connect with the crude gas; but if I could not do that I would connect simply into the air with two relief valves, one opening in and one opening out, and very carefully cover the openings with brass wire gauze. We would lose that vapor, but we would rather lose it than get it into the gas not fixed. Of course we should take every possible care to prevent fire by selecting a proper position for the tank.

Mr. Forstall—Mr. Collins dismisses the matter of unloading by gravity as being "convenient and lazy;" but there are some situations where it is almost impossible to do anything else, and there are some precautions which may be taken in that case. At Newark we very rarely handle oil by tank car, although occasionally we have to do it. Our switch is some 700 feet from the works, and about 30 feet higher than the works, so that pumping is entirely out of the question. We have to run the oil down by pipe line through the street. We have no boiler anywhere near the switch, and do not carry our steam pipe up there for the simple reason that we seldom use the switch in unloading. So we have to unload by gravity. Of course we make a perfectly close connection between the bottom of the tank and our unloading tank, with a rubber hose fitting the tank connection with a tight fit. In case of a leaking tank valve, we take up always, before we start the tank, a quantity of coke breeze, and pack that directly under the tank car and under the outlet, before we loosen the cap at all. It is seldom that a car leaks so badly that the breeze will not absorb the oil that comes out, and it is only a question of a minute to get the tank connection closed up so that there will be no leakage at all. We are within 10 feet of the through line track on which suburban trains are passing every half hour; and it is our rule that nothing shall be done to the tank car, either by opening the dome or opening the valve, if there is a train anywhere in sight. When we do open the dome to lift the valve it is immediately closed. We work through a vent pipe, and cover that with wire gauze of about 100 meshes to the inch, and I think that obviates all danger of any spark lighting the oil vapor and getting back into the tank. We have used it for two or three winters and have never had the least trouble with it. As for freezing, we have very little trouble from that. Of course there is less trouble with naphtha freezing than there would be with crude oil, as water is more apt to be in crude oil than in naphtha. We always take up enough hot water to thaw out the valve by outside application.

Mr. Butterworth—Mr. Collins' paper is full of valuable hints, and will be read by us all in connection with any work we may have to do in storing oil. I move to him a very hearty vote of thanks. (Seconded by Mr. Odiorne, and carried.)

Report of Memorial Committee.

Mr. Butterworth read the following report of the Memorial Committee, which was, on motion of Mr. Shelton, adopted by a rising vote:

It is the painful duty of your Committee to chronicle the death, during the past year, of two members of this Association, one of whom was among the youngest, and the other from among the older of our members—Mr. Henry C. Felt and Mr. George H. Wells.

Henry C. Felt was for several years past Agent for the American Meter Company, with headquarters at Cincinnati. He died at St. Louis on January 7th last, in the 24th year of his age, and was buried in that city with full Masonic honors.

Geo. H. Wells was well known to the members of this Association and to the fraternity at large, having been for a quarter of a century the Superintendent of the Nashville (Tenn.) Gas Light Company. He died in Nashville, on November 22d last, aged about 63 years, and he also was buried in accordance with the Masonic ritual.

Your Committee recommend that proper recognition be taken by us of the death of these two of our number by instructing the Secretary to communicate with their families in expressing to them our sorrow and regret at the loss which we have sustained, and, also, that a proper record be made of this action in the minutes of the Association.

Irvin Butterworth,
C. H. Evans,
Jas. Forbes,
} Committee.

Report of Committee on President's Address.

First Vice-President Odiorne took the Chair, and Mr. E. H. Jenkins, from the Committee on the President's Address, read the following report:

Your Committee, to whom was referred the President's Address, beg leave to report. We feel that we voice the sentiment of the members of this Association in stating our opinion that this address, without disparagement to others, is one of the most valuable, practical and inspiring Presidential addresses that has been presented to the Association for many years, dealing largely as it does in practical data and figures rather than in glittering generalities. That a gas engineer who is so closely in touch with the profession and industry should be able to point out so many new fields capable of development, as well as enlargement of the gas business on present lines, is especially gratifying and inspiring. We commend the address for careful study and perusal on the part of our members.

We especially draw attention to the interesting and startling figures and facts presented in regard to the possibilities of the utilization of the gas and bye-products of coke ovens on a large scale, whereby a fuel gas may be supplied in cities that are now enjoying the use of natural gas but who may in the near future have to resort to other fuel. In view of the special interest attaching to this particular portion of the address we recommend that the Secretary be requested to secure if possible for our next meeting a paper treating further on this subject. Another important field opened to our view in the address, for the increased use of gas, is that of its employment for street car propulsion. Should its application for this purpose be made successful, the enormous increase to our business would make this topic of great interest to each and every member.

The entire address shows careful and conscientious preparation,

and we feel that the Association is to be congratulated in having so valuable a paper presented for its consideration.

E. H. Jenkins,
Irvin Butterworth,
E. G. Cowdery,
} Committee.

On motion of Mr. Nash, seconded by Mr. Thompson, it was voted that the report be adopted, and that the Secretary be instructed to have 400 copies of the address printed for future distribution.

President Baxter resumed the Chair and called upon Editor Geo. T. Thompson to take up the

WRINKLE DEPARTMENT.

Mr. Thompson then read the following Wrinkles:

Clamp for Lowering Standpipes.

When taking down the iron work of a series of benches preparatory to rebuilding, the light "cranes" shown in Fig. 1 were found very convenient for lowering standpipes, etc. The L-piece of the crane or clamp is hung in the outer pipe of the bridge casting, and its curved

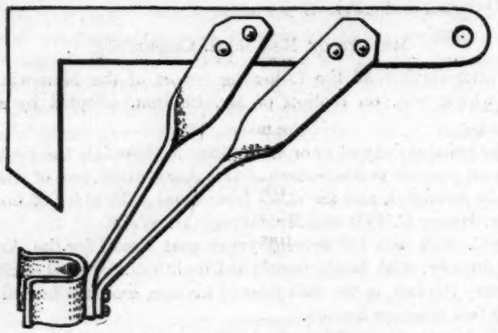

Fig. 1.—Clamp for Lowering Standpipes.

foot bears upon the outside of this pipe, above the standpipe flange. A block and fall is hung by a hook from the hole in the outer end of the crane, which, being made of 2½-in. x ½-in. iron, is light enough to be moved along wherever required.

St. Louis, April 13th, 1895.

Varying the Superheater Proportions in Making Water Gas.

While running a set of water-gas apparatus of well known type, I recently found proportionally immense quantities of naphthaline in our purifiers, and had to change boxes frequently owing to the pressure before the material was at all foul. After finding and remedying a number of other causes of the production of the pest without banishing it entirely, I found that the proportion of fixing surface in our carburetor and fixing chamber was too large for the quantity of oil necessary to carburet the water gas which we could produce in the generator, so I did the following: Had an oil-pipe nozzle rigged to the superheater bottom. By running the oil in at this point every few runs we cleared the obstructions in the purifiers (apparently absorbing the naphthaline previously deposited there, as demonstrated by removal and inspection of the covers), and thus enriched the gas to a considerable extent; that is, made richer gas with less oil for a time, owing no doubt to the absorption of the naphthaline as stated. We aim of course to make neither tar nor lampblack; but while making none of the latter we yet got that naphthaline; and by applying this remedy we made none of the former, with the result stated.

The effect of the use of this "oil by-pass" which has been described was simply to avoid subjecting the oil and its subsequent vapors and gases to so much heat; the oil-gas was sufficiently fixed, and neither an excess of tar, of lampblack nor naphthaline was formed to any extent. If we had used retort house coke we should have been all right as to proportions of apparatus, because the material in the generator could have been more quickly heated to the proper temperature. But as we used anthracite, and of course to get a suitable heat in the generator had to use the air-blast longer than required with coke, we had a choice of throwing a lot of unconsumed gas into the air, of blowing in an excess of air to keep the heat down, of taking out a lot of firebrick in either carburetor or superheater, or both, or of doing as we did, viz., by-passing the carburetor occasionally. This last had the merit that if by any chance the heat was *not* too high, the old way to use the oil was still there; and, in like manner, we could use retort house coke at any time.

Frederic Egner.

Norfolk, Va., March 12th, 1895.

Discussion.

Mr. Clark—Does Mr. Thompson desire to discuss these various items as they are read, or have them taken up after they are read? Will gentlemen who are not present be permitted to send in discussions?

Mr. Thompson—Last year the practice was to discuss the Wrinkles after they had all been read. As to the discussion now, I may say that the writers of all are not present, and of course I cannot answer questions about some of them as understandingly as the authors would. Still many of them are self-evident; possibly others might answer the questions as to some, better even than the author or myself.

Mr. Humphreys—I would suggest that we discuss them as they are read.

The President—If there is no objection we will take that course.

Mr. Thompson—In that case the first two Wrinkles are now open for discussion.

Mr. Humphreys—As to the second, I feel like throwing out a word of warning. By-passing oil in that way might do for a city in the South, but I know a case where they did not by-pass it as seriously as that, and so lost 7 candles while sending it over a bridge. That is not what the superheater or carburetor is there for. I do not believe that any works in the world can have too much carburetor or superheater capacity, if it is properly used.

Mr. A. S. Miller—Of course it is very well known that oil vapor will dissolve naphthaline. Mr. Humphreys suggests that this by-passing may answer in a Southern city. I wish very much that the author of that paper were here, as I would like to ask him what the costs of meter repairs are at his works, and what effort is made to determine what percentage of the gas is fixed. Of course it is well known that if oil is vaporized but not fixed your results in the works will be higher—I refer to the immediate results. You will get more light per gallon of oil in the works, but if you go to the end of the main to test it, you will probably find you will not get quite as much. I hope the gentlemen will not take Mr. Egner seriously on this subject, or adopt his suggestion too freely; because a long series of experiments has unquestionably shown that it is very necessary to have the oil properly fixed. In connection with the point as to anthracite coal, as a rule more gas is made when anthracite is used instead of coke, and it is all the more necessary we should have more fixing surface in connection with anthracite. If he would blow his machine hard enough—in other words, get enough head between the top and bottom of the fire—he can throw enough excess air in to bring the fire in the carburetor and superheater to a proper temperature at the same time. It can very easily be done if he gets in proper blowers (if he has not them already), for if he will blow his fire hard enough he can get just enough combustible gas on top of the generator to bring the other two vessels to a proper heat. I think it would be a great pity to by-pass the carburetor from any idea that he has too much fixing surface on any machine ordinarily used. I believe he has the ordinary type of machine, and I think it is probably an error to by-pass it.

The next Wrinkles read were:

Enlarged Dials for Oil Meters.

This device has been found very satisfactory in connection with water gas manufacture. The small dials are the same as in regular use on meters. The large hands in the center (see Fig. 2) revolve like the hands of a clock, registering units and tens, one making a revolution for each 10 gallons and the other for each 100 gallons. The dials are placed vertically, so that they may be seen from any portion of the generator house.

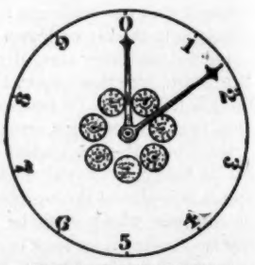

Fig. 2.—Enlarged Dial for Oil Meters.

The large hands may be set to zero without interfering with the continuous registration of the meter, so the gas maker loses no time in taking the index, and is less liable to error. The small dial is a check on his work.

"Incog."

Emptying Oil Cars.

In transferring oil to the storage reservoirs on the gas works from the tank cars in which it has been shipped, probably the most common form of attachment to the pumping line is that which is made from the bottom valve of the tank car by means of a union on a length of rubber suction hose. But the life of a hose used for this purpose is necessarily short, especially when naphtha is handled; and the bottom valves of the tank cars are frequently found leaking when their caps are removed. These difficulties entail expense, loss of time, and often a con-

siderable loss of oil; and in cold weather it is no easy matter to connect the union below a leaky valve, with the rapidly evaporating naphtha pouring over one's hands. Dangerous and disastrous fires have also occurred from leaks of oil from the valves of tank cars.

For these reasons we have long since discontinued the use of this method of unloading oil. Instead, we provide a line of pipe terminating with half a flange union at a point beside the track, and a little higher than the dome of a car. Another piece of pipe long enough to reach the bottom of the car, with an elbow, a short length of pipe, and the other half of the flange union, is attached when the car is set. This completes the connection, permitting the car to be emptied without touching the valve, and without any rubber hose to be dissolved or to kink and harden. The attachment to the pumping line is much more easily and quickly made than when using the valve, and the system has been most satisfactory in every way.

Lest a spark from a passing locomotive might fall into the dome of the car, the opening is protected by a light sheet iron cover, having a slot to admit the suction pipe, and a slide hinged on a rivet to cover all but the 3 inch pipe opening when all is adjusted.

St. Louis, Mo., April 12th, 1895. George T. Thompson.

Safety Devices for Exhauster Engines.

An instance of the differing methods by which corresponding results may be attained is shown in the devices used at two stations of the same gas company, to prevent the exhauster engines from "running away" in case the load should be suddenly thrown off by a breaking belt or similar mishap. In the first case the ordinary float of an exhauster governor is provided with a gas connection from the inlet main of the exhauster, and so weighted that it hangs well down in the tank while the desired vacuum is maintained. The arm from the bell is attached by a chain to a throttle valve on the steam pipe to the engine, and this valve is thus held open when the float is down or nearly so. Any mishap resulting in the stoppage of the exhauster would change the vacuum to a pressure, raising the float and stopping the engine. In other words, this device is used in addition to the usual governor, and exactly reverses the action of the latter after a certain limit is passed.

In the second instance the possibility of a broken belt was most to be guarded against, and the belt in question ran horizontally, any stretch being taken up by an idler which hung between iron arms projecting from a wooden frame. From the idler a chain was run over pulleys to a lever attached to the stem of a butterfly valve in the engine steam pipe. A breaking of the belt would drop the idler, and so shut off the steam.

While fortunately neither of these devices has yet been required in the emergencies for which designed, they both received experimental trial under working conditions when first installed, and operated satisfactorily. Geo. T. Thompson.

St. Louis, April 13th, 1895.

Discussion.

Mr. A. S. Miller—I would suggest in such a case the use of the ordinary ball governor on the engine. The ball can be set at any speed above which the exhauster is run, and that would catch the engine in case the load was light. The engine would only run up to the speed at which the governor was set.

Mr. Clark—I understand when the exhauster is run on coal gas a varying speed is necessary to control the pressure on the hydraulic main, and that there the ball governor would not do at all.

Mr. A. S. Miller—You can get it above any speed which would be run in practice; and then, in case the belt should break, it could only be run up to the speed at which the governor was set.

The next Wrinkle read was:

Avoiding Nuisance when Opening Purifiers.

In the case of works centrally located, or where for any reason all nuisance must be reduced to a minimum, some arrangement such as the following is advisable for expelling and burning the offensive gases occluded in the material of the "off" purifying box before lifting the cover preparatory to changing the material, or when reviving the material by blowing air through it. A large iron pipe is run from underneath the boiler to a convenient point near the center seal—say close to the inner corner of one of the boxes—and terminating just above the floor, where it connects with a large rubber hose of sufficient length to allow its other end to be connected in turn to the cap holes in the covers of the different boxes. Air is blown through the "off" box by a suitable blower connected to the gas inlet, and the foul gases occluded in the material are thereby driven off through the iron blow-off pipe to the boiler, and there consumed. At a convenient point in the blow-off pipe a tight seal box should be placed, with sealed overflow set to maintain a shallow water seal, through which the gases are forced in order to prevent an explosion in the purifying box in case these gases should "light back" in the blow-off pipe at the boiler. While the blower is in operation it is well to allow a small stream of water to run constantly into the seal box in order to avoid the possibility of the pipe becoming unsealed by evaporation, or otherwise.

Columbus, Ohio, April 8th, 1895. Irvin Butterworth.

Discussion.

Mr. Humphreys—I would be afraid of that. It appears to me there would be nothing between you and trouble except a shallow water seal, and anything going wrong with that seal would likely lead to a disastrous explosion. I think that should be adopted only after much anxious thought.

Mr. Butterworth—We have had that method in operation in our works for several years and have had no accident; nevertheless it may be dangerous. With us it is very important that we should reduce all nuisance to a minimum.

Mr. Humphreys—I know some who were absolutely forced to do something in that direction, and made such an arrangement as Mr. Butterworth describes, but without a seal. They ran along for quite a while without an accident, but finally had one. Then, I believe, it went right along again, and they have had no accident since. Whether they introduced any safeguard after the initial accident I do not know.

The next Wrinkle was:

Steam Hose Attachment for Holder Cups.

Steam hose on holder cups usually give out first at the end of the nipple, as shown by the dotted lines at *b*, Fig. 3. We obviate this difficulty by the use of a support or bracket *a*, which is placed under, and

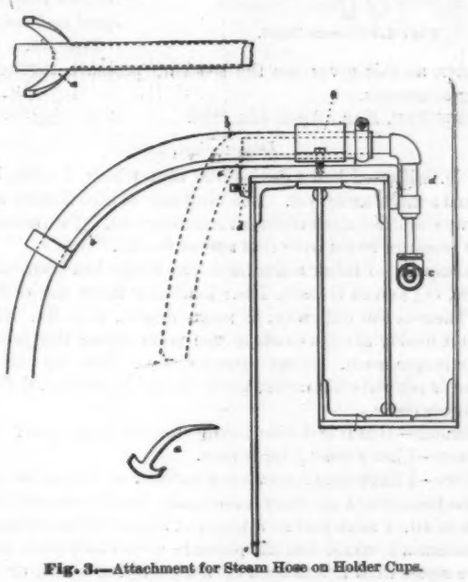

Fig. 3.—Attachment for Steam Hose on Holder Cups.

clamped down with, the hose. As the holder rises the hose falls into the support, and, following its lines, cannot get kinked or bent enough to harm it. The hose is attached to the grip by the usual clamps *d* and *e*. R. B. Brown. (Communicated by A. E. Forstall.)

Newark, N. J., April 6, 1895.

Discussion.

Mr. A. S. Miller—What is the matter with bending a pipe, or passing the hose through the pipe?

Mr. Thompson—There are a number of instances where pipe is bent for that purpose. Another method for obviating the difficulty is to use an elbow, with a short nipple attached, to hold the hose, and with this nipple hanging down the side of the holder instead of laying it across the top of the cup. These are simply different methods of reaching the same result.

The next Wrinkle read was descriptive of a

Pressure Board.

Fig. 4 is a sketch of a pressure board such as I am using in this works. You will see I have five pieces of apparatus attached on this

board. I have not marked them as I have them on my board, as any piece can be marked as the pipe comes to it. My board is, No. 1, washer and scrubber; No. 2, meter; No. 3, outlet center seal; No. 4, scrubber No. 2; No. 5, purifiers. Any other arrangement can be made as desired.

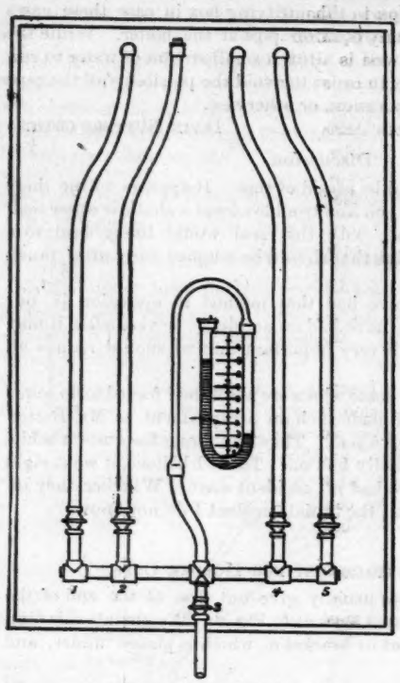

Fig. 4.—Pressure Board.

This board is attached to the wall, and pipes leading thereto are brought from any parts of the works to it, and connected on opposite sides by unions. The pressure is readily shown by *one* gauge instead of five.

Another device I use is a paper attached back of gauge with the highest pressure recorded thereon. Say, when we are pumping oil and the largest volume of gas is passing, I take the extreme pressure given and mark same down on this paper. This shows me my extreme pressure; so when working regularly any increase is shown and the trouble very readily located and remedied.

Pipe No. 1 I leave on at all times, as this gives me the working pressure through all my purifying apparatus.

W. Tracy.

Leavenworth, Kas., April 4th, 1895.

Discussion.

Mr. T. D. Miller—I had a device like that which I used, but it has not worked satisfactorily yet. The long line of pipe became stopped up in some way and required constant steaming out. You never can rely upon the pressure to get over that sort of device.

Mr. Thompson—I think a similar device to this has been employed in Columbus, O., and in Galena, Ills.; doubtless there are others in addition. There is the difficulty, to some degree, that Mr. Miller mentions, but it nearly always exists at the point where the pressure pipe leaves the larger main. These pressure pipes have no valve there to them; but if properly connected there should be no special difficulty in keeping them clear.

Mr. Hinman—Has this device been in use for some time?

Mr. Tracy—I have used it for a year.

Mr. Miller—I have used it now for a number of years, but can never rely on the pressure. I get such astonishing results at times that I do not rely on it at all. I have had new pipe put in, and when running rather large sometimes I would find the pressure would be higher as it got towards the meter than it was back of the purifying boxes, or even just after passing the exhauster. If any one can put me in the way of reaching a method of making that work satisfactorily I would be very much obliged.

Mr. Tracy—I use a ¾-in. pipe, and run-off pipes from that. I have never experienced the least bit of trouble in the years I have used it.

The next Wrinkle read was on an

Adjustable Scale for U-Gauges.

Fig. 5. Adjustable Scale for U-Gauges.

The drawing of this device (Fig. 5) explains itself. I found here quite a loss of water in our gauges during the greater part of the year. To replace the water just to the zero mark is not very convenient, for it is so easy to have not enough or too much water, when the reading is not alike on both sides, and has to be added up. This induced me to use an endless tape running over rollers top and bottom. I adjust the zero mark to the lowest water level, when the highest level gives me the correct reading.

John Gimper.

Galveston, Texas, Feb. 5th, 1895.

Discussion.

Mr. Hinman—I had a pressure gauge prepared like that exactly, and it had the sliding scale but not the table rest.

The next three Wrinkles read were:

Leveling Street Mains.

Fig. 6 exhibits a method of grading street mains when laying, especially if a dead level has to be maintained. Stakes are driven into the ground to the grade of the top of pipe line, as at *x*, and at convenient distances apart; of course this is done with a surveyor's level. Three targets are made, *a*, *b* and *c*. Target *c* is set on top of stake *x*; the top of this target has a cross-piece upon which is a horizontal line (white on black field) visible to the naked eye from *a*. Targets *a* and *b* are of same height as *c*, and are fastened to a collar fitting the top of pipe, as shown in the enlarged view of target, Fig. 7. *y* represents a

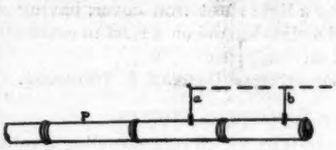

Fig. 6.—Laying Street Mains Level.

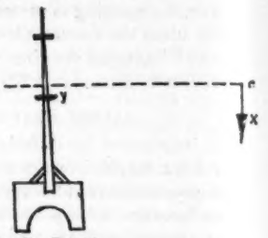

Fig. 7.—Target.

small pocket spirit-level fastened to target; when set level target with stand plumb. *a* and *b* are fitted just alike; on top of each is a cross-piece, also a nail for sighting. The target *b* is set near the last bell; by looking over the sights from *a* to *c*, it will be seen if the bell end of the last joint is too high or too low. It is always best to have the last bell too high, so you can ram it home and thereby get a firm bed for your pipe; in hard ground this is difficult to do, but in our sandy soil here it works splendidly.

Of course where the grades are pronounced this method will not be needed, but it is very useful where you must lay on a dead level, of which I have a great deal to do here.

John Gimper.

Galveston, Texas, March 5th, 1895.

[A method similar to that of Mr. Gimper, but enabling an absolutely uniform grade to be maintained with ANY desired degree of "fall," was described in the installment of Wrinkles presented before the Association in 1893, and published in American Gas Light Journal, June 5th, 1893, p. 816; Light, Heat & Power, May, 1893, p. 274; Progressive Age, June 1, 1893, p. 193.—Ed.]

Lever for Drawing Bars in Street Work.

The device shown in Fig. 8 is a lever and stand for drawing out a probe when it has been driven into the ground over a gas main in searching for leaks. The lever is about six feet long, made of some strong hard wood, with a hook bolted fast at the larger end to receive a short chain which is made with a strong ring at one end. About five inches from the larger end of the lever is a ¾-inch hole for the pin which fastens it to the crutch. This crutch is about one foot high, and

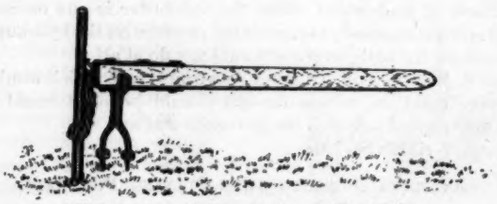
Fig. 8.—Lever for Drawing Bars in Street Work.

its prongs have sharp points to keep it from slipping, with a collar about one inch above each point to keep it from pressing too far into the ground when the pressure comes on.

The way I operate it is: After the bar is driven into the ground to loop the chain over the bar close to the ground, then hook it on to the hook at the end of the lever, press down on the lever as it comes up, loosen the lever, and the chain immediately drops on the rod and you can lift it up a few inches each time. The device is very simple and operates very quickly. I have used one for three or four years.

Everything will have to be made very strong, as it requires a good deal of pressure to draw a rod out of frozen ground when it is driven in

three or four feet. I also find that by heating the bar it will come out of frozen ground much more readily. W. H. ODIORNE.

SPRINGFIELD, ILL., February 1st, 1895.

A WRINKLE FOR SERVICE LAYING.

The sketch, Fig. 9, illustrates a method of overcoming the difficulty occasioned when a sewer or some similar obstruction is found to be directly in the way of a service pipe, or even a small street main. The

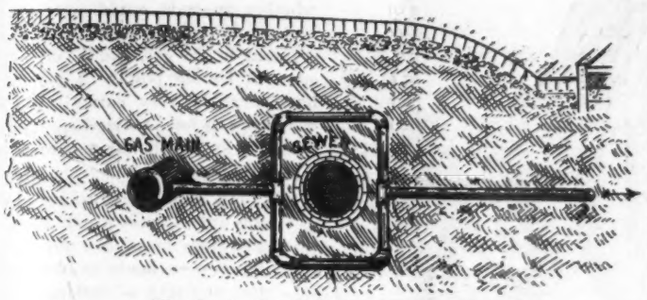

Fig. 9.—Avoiding Obstructions in Service Laying.

pipe can be branched and taken both over and under the obstruction, uniting into one again on the other side; the under branch to allow the condensation to flow back to the main, and the upper branch to serve for the free passage of the gas. HENRY L. DOHERTY.

Communicated by Irvin Butterworth.

COLUMBUS, O., April 8th, 1895.

Discussion.

Mr. T. D. Miller—Not long ago I used a 4-inch main on an 8-inch sewer, and it worked very satisfactorily.

Mr. Clark—This most admirable device is entirely new to me, and I assume it is new to most of the members. I think it is an excellent device and extremely ingenious. I suppose there is a necessity for some union, and I would like to ask how the connection is really made up and used.

Mr. Butterworth—It is made with a right and left thread.

Mr. Thompson—I might explain that the drawing was made by a gentleman who is decidedly unfamiliar with the gas business.

Mr. T. D. Miller—We have a cast iron pipe, and there is no union necessary there. I made a passage round the sewer in this way with the cast iron pipe and no union.

The next Wrinkle read was on a

CHEAP AND DELICATE TEST FOR PIPING.

The little bottle and its simple attachments, shown in Fig. 10, may be used to test the tightness of house piping, meters, etc., more rigidly than can be done even with a proving pump and mercury gauge. The bottle contains enough water to seal lightly the longer tube or inlet, and to the side openings of the glass tees are connected pieces of rubber hose—that to the inlet tee from a gas supply or a bag to provide a light pressure, and the one from the outlet tee to the piping to be tested. The pinch cock on the rubber tube which bye-passes the seal is opened until the pressure from the service pipe or gas bag has equalized throughout the pipe or vessel under test, and then is closed. If a leak exists in any portion of the work, it must be now supplied through the bottle, and the bubbles from the sealed tube are a clear indication. B. E. CHOLLAR.

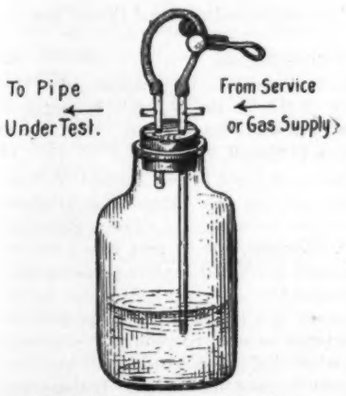

Fig. 10.—Delicate Test for Piping.

ST. LOUIS, April 20, 1895.

Discussion.

Mr. Thompson—I have here a model of the device in question, or rather a working bottle. The bottle, as you see, is a very small one. We will suppose that it is desired to test a line of piping in use. The connection from the chandelier here corresponds to one which would be made from the service pipe. The one at the outlet of the bottle corresponds to the one which would be made to the riser of the house pipe. I will close the end of the pipe in order to prevent the exit of gas, and make a condition similar to that which would exist in tight piping. The pinch cock is set on this part so that the sealed tube is by-passed. When the pressure has thoroughly equalized on both sides of the line the pinch cock is raised. If that pipe is tight no gas will pass through; but if any outlet exists the bubbles will rise through the water. A very minute leak can be in that manner detected. In fact, it is possible with a line of piping to sprinkle water on the pipe and condense the gas to such a degree that a few bubbles will be allowed to pass. It might be well to make that remark as a warning not to be deceived by such appearances as would indicate the existence of a leak, but which were only caused by contraction.

Mr. Thompson then read the following

WRINKLETTES.

A small steam siphon, which may be "home made" by any good mechanic, is very convenient in removing the water from the ashpits of water gas generators.

An excellent mortar for firebrick work where not exposed to the direct impinging action of flame, is made from common clay with just a sufficient proportion of river sand to permit proper handling with a trowel. This will bake hard, and hold tighter than fireclay.

Seal pots are preferable to siphon overflows about a works. In case of a blow out, the former of course reseal themselves as soon as the pressure subsides, while the latter must be shut off and refilled by hand.

The projecting stem of an outside screw gate-valve may be conveniently protected by slipping over it a piece of old rubber hose of proper size. Short pieces of pipe, capped, are sometimes used for the same purpose, but the hose seems preferable.

By mixing a small quantity of melted paraffine with coal tar, a blue-black paint is obtained which holds its gloss better and is much easier of application than without this addition.

Turn steam into the water in holder tanks when the temperature of the surface water is reduced to 40° F. This being approximately the temperature of water at its maximum density, it is then certain that the entire contents of the tank, clear to the bottom, are equally cold; and with any further reduction of outer temperature the water much more quickly approaches the freezing point.

When laying new mains, before closing in the trench, cut a mark thus ⊢ on the curbstone opposite (say) each fifth bell, to show its location and direction. Where several cement joints are made to one of lead, this mark is best cut opposite the lead joint. The marks are of advantage when barring for leaks, recaulking mains, etc., and it is especially convenient to have some such indicator of each dead end for use when extending lines of pipe.

When new buildings are being erected it will pay to get the builder to leave a vertical slit, say 2 inches by 12 inches, for the entrance of the gas service at a proper position in the cellar wall. In cutting out rubble-blocks which lie in the way many an hour is lost by service men, which could be saved, with less damage to foundations, were this device adopted. After completion of the service laying the remainder of the slit may be cemented up. This arrangement is much better than the short piece of pipe sometimes built in, which seldom can be placed at the necessary height or with the proper fall.

A note from Mr. W. A. Aldrich calls attention to the great protection afforded service-pipes by laying them in V or U shaped troughs, filled after the pipe is laid with hot pitch, as described in King's Treatise, Newbigging's Hand Book, Colyer's Gas Works, etc.

EDITORIAL NOTE.

At the convention of our Western Gas Association in 1893 the hope was expressed that the institution of this Wrinkle Department "would bring to us as contributors many of our members who have never appeared on the paper lists, yet who could without doubt tell us of valuable contrivances or methods used by them which would be new and serviceable to us, yet which they might not consider sufficient in scope to warrant expansion into a regular paper." As at the inception of any work such as this some initiative is necessary, the budgets of items for 1894 and 1895 were practically all obtained by personal solicitation; but it is thought that the plan of the Department should now be sufficiently familiar to bring our members to voluntarily forward suitable contributions for this feature of our meetings. Items may be sent to the Secretary at any time, but will be especially acceptable if received prior to April 1st, of each year, which will ensure time for their arrangement and illustration for the convention.

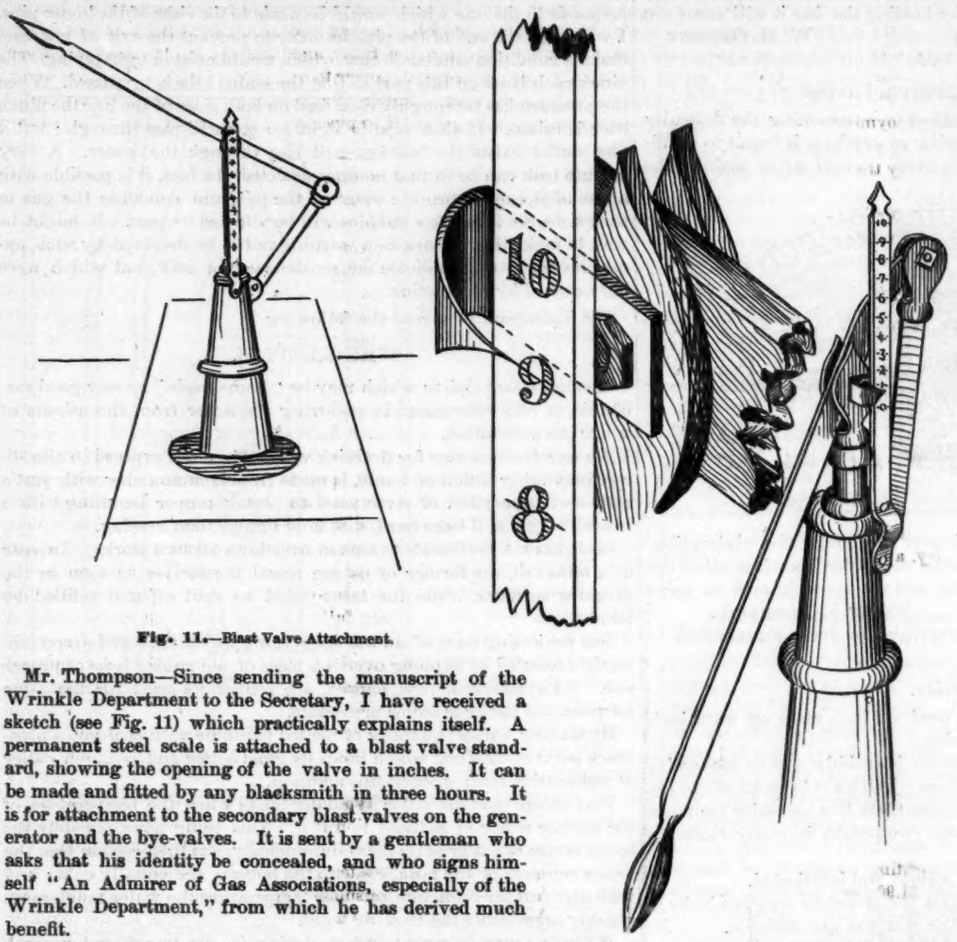

Fig. 11.—Blast Valve Attachment.

Mr. Thompson—Since sending the manuscript of the Wrinkle Department to the Secretary, I have received a sketch (see Fig. 11) which practically explains itself. A permanent steel scale is attached to a blast valve standard, showing the opening of the valve in inches. It can be made and fitted by any blacksmith in three hours. It is for attachment to the secondary blast valves on the generator and the bye-valves. It is sent by a gentleman who asks that his identity be concealed, and who signs himself "An Admirer of Gas Associations, especially of the Wrinkle Department," from which he has derived much benefit.

Mr. Ramsdell—I move that the hearty thanks of this Association be tendered to Mr. Thompson for his work in connection with the Wrinkle department during the year. I think that department is one of the most interesting features of our Association work, and I think he deserves very great credit for the able manner in which he has filled his position.

Mr. Clark—In seconding Mr. Ramsdell's motion, I want to express my appreciation of the great value of Mr. Thompson's labors. He is practically a paper writer every year. He does much more than his appropriate share of work in the Western Association, and what he gives us is always valuable. I regret that so few members have remained here to enjoy this part of our session, for they have certainly missed a very instructive and interesting half hour.

Mr. Stratton—Before the motion is put I would like to add that I think it would be well to have this department come up first instead of in the latter part of our meeting. I think it would be a good plan to change it. (The vote of thanks was agreed to.)

THE QUESTION BOX.

The Secretary here read the contents of the Question Box, the questions being asked and answered in the following order:

1. "What is the best way to prevent the sweating of show windows of gas lighted storerooms in the winter time?"

Mr. Gwynn—I have seen a great many experiments tried to prevent show windows from sweating. One way is to close them tightly on the back, so that there is no communication between the window and store, and then perforate the woodwork on the outside, just above the bottom and also at the top of the window, so as to admit and cause a circulation of fresh air in the window. If the window is properly ventilated and a sufficient quantity of air is admitted from the outside, I think there will be no trouble in preventing the sweating.

2. "Does the candle power of the gas affect the size of the flame, and in what proportion—pressure and burner being the same?"

Mr. Miller—I think that is a subject on which a paper might be written. It requires a great deal of careful study and experiment, and should not be answered off-hand.

The President—It would take a number of experiments to find out.

Mr. Highlands—If that pressure is heavy it would; but in what proportions? I question whether there is anybody who can give an off-hand answer to that question.

Mr. Humphreys — I question whether anybody could, anyway. It depends entirely upon the constituents of the gas, and the difference in candle power. I would have to study very carefully the conditions before answering. An answer to any particular case would not apply to any other.

3. "In cases of introducing gas into houses which have not been piped has any attempt been made to obviate the necessity of tearing up floors, or of disfiguring ceilings? (1) By using a special kind of pipe; or (2) by inclosing common pipe in suitable moldings?"
4. "Has anyone had experience in heating dwellings or offices with furnaces in which artificial gas was used as fuel?"
5. "Does the Welsbach burner produce as much heat, light for light, as an ordinary batwing burner?"

Several Members—No.

6. "What percentage of loss in storing and handling 62° to 65° naphtha, cheese box form tank, capacity 12,000 gallons, inclosed in brick building partly below surface of ground, measuring tanks; overflow connected with storage tanks; no apparent leaky joints or connections?"

Mr. Highlands—I move that that be referred to Mr. Thompson's "Wrinkle Department."

7. "Is the cheese-box form of tank the best under all circumstances?"

Mr. Humphreys—I think we have answered that and shown that we quite materially disagree.

The President—That completes the questions.

Mr. Butterworth—I do not know whether it is the intention that Mr. Thompson should be re-appointed Editor of the Wrinkle Department each year. If it is necessary I wish to make that motion.

Mr. Sanderson—His appointment is for life, I think.

The President—That is so. There is a paper by Mr. Donald McDonald, of Louisville, Ky., on "Natural Gas as a Pioneer for Artificial Fuel Gas." He is not here, nor has he appointed anyone to read it. Mr. Case's paper was read by Mr. Cowdery, but in that case I believe he was requested by the writer to read it. What is your pleasure with regard to this paper by Mr. McDonald?

Mr. Thompson—In the absence of Mr. McDonald, I move that we omit the reading, but publish the paper in our Proceedings. (Carried.)

The President—I suppose that when that is published it will be clearly stated that the paper was passed without discussion. Is there any other business to come before the Association? Is the Committee on Final Resolutions ready to report?

Mr. Highlands—On behalf of that Committee, although not a member of it, I submit the following resolutions and move their adoption:

Whereas, The 18th annual meeting of the Western Gas Association is about to adjourn, after a most successful and profitable session; and,

Whereas, We believe that public and formal acknowledgment should be made by us of our obligations to those who have contributed to its success, therefore,

Resolved, That we hereby express our appreciation and thanks for the efforts that have been so freely and efficiently given in behalf of the success of this meeting, and the pleasure of our members, by the Pitts-

burgh Gas Companies collectively and by their officers individually; by the exhibitors of gas apparatus who have provided for us a most notable and interesting exhibition of their appliances; by the local manufacturing companies who have co-operated with the Gas Companies in providing social entertainment for our enjoyment; by the Committee of Arrangements; by the Pittsburgh press; and last, but not least, by the officers of the Association, especially by the President and Secretary.

Mr. Morgans seconded the motion of Mr. Highlands, the resolutions were unanimously adopted, and the President declared the business sessions terminated.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

LOCAL capitalists are inquiring as to the advisability of constructing a gas plant at Neosho, the most prominent of those interested being Mr. John M. Sherwood, who is well and favorably known in that vicinity from his connection with the lead mining interests of the district. Neosho is the capital of Newton county, Mo., and is on the Atlantic and Pacific Railroad, at a point 73 miles west southwest of Springfield and 22 miles south of Carthage. The population of the township is about 6,200, and of the village, possibly 3,300. It is quite a busy place, having flouring and woolen mills, a foundry, a machine shop, and many promising mines of lead.

MESSRS. HUMPHREYS & GLASGOW inform us that they have just contracted with the Central Gas Light Company, of New York, for the installation of one of their improved water gas plants, up to a maximum daily producing capacity of one million cubic feet. The apparatus is especially adapted to the handling of heavy oils. Messrs. Humphreys & Glasgow have also just contracted for the installation of a plant of like capacity for the Gas Company of Bath, England. Besides the plants already completed by Messrs. Humphreys & Glasgow, they are now under contract (including the two awards above mentioned) to erect plants aggregating a daily capacity of over 13 millions cubic feet.

ON July 1st the Los Angeles (Cal.) Lighting Company, of Los Angeles, Cal., will reduce its selling rate to $1.90 per 1,000 cubic feet.

MR. J. LEE JUDSON, President of the Rochester (N. Y.) Gas and Electric Company, has issued the following notice: "The Rochester Gas and Electric Company, successor to the Citizens Gas Company, of Rochester, N. Y., hereby gives notice that all of the bonds of said Citizens Gas Company, amounting to $250,000, and secured by the mortgage given by it to the Union Trust Company, of New York, dated March 1, 1880, and recorded in Monroe County Clerk's office, in liber 225 of mortgages, at page 225, have been called for payment on Sept. 1, 1895, pursuant to the right therein reserved to pay and retire said bonds before maturity. Said bonds and all of them will be paid, principal and interest, in full, by said Rochester Gas and Electric Company, as successor of said Citizens Gas Company, at the office of the Security Trust Company, of Rochester, N. Y., in the Granite Building, in the city of Rochester, N. Y., on September 1, 1895, on presentation and surrender of said bonds and all unpaid coupons. Interest on said bonds will cease on September 1, 1895."

THE Lowell (Mass.) Gas Company will make many additions to its main system this summer.

THE Chicago City Council has ordered that an investigation be made of the right of the Universal Gas Company to construct a plant on the site that its managers are said to have purchased.

AT the annual meeting of the Consumers Gas Company, of Reading, Pa., the officers chosen were: Directors, Henry Baumgardner, S. A. Bodine, Edward C. Lee, Wayne MacVeagh and Richard L. Jones; President, Henry Baumgardner; Secretary, John H. Keppleman.

SINCE the Glen Ridge (N. J.) voters elected to separate from Bloomfield and become a borough all to themselves, the gentlemen who were named to the Glen Ridge Council have, as is usual with the importance of new fledged dignity, been looking for something to do. The first incorporated Company to attract their attention was the Montclair Gas and Water Company, of Bloomfield, which concern went on calmly putting its pipes through Glen Ridge whenever and wherever such piping looked to be necessary, and did so without appealing to the Glen Ridge Council for permission. Some of the Councilmen thought this was high-handed, and they instructed Councilman Reddall to look into the matter. Mr. Reddall, having "looked," reported that the Company's charter was from the State, and that under its provisions the Company was clothed with power to open any street in Morris county; in fact, he thought the Company's rights in this particular were sufficiently sweeping to permit it to pipe any public roadway in the entire State.

THE Massachusetts Board of Gas and Electric Light Commissioners submitted the following report to the State Senate on the matter of electric light meters, pursuant to a resolution for the Board's knowledge adopted by the Senate some time ago: "The Board has entertained some doubts as to the method which the Legislature intended it to pursue under this inquiry. We have no facilities for the careful testing of meters in actual use, and the expense of examining any considerable number through the employment of a competent expert would be too great to be covered by any available appropriation. It would seem, moreover, that the purpose of the resolve might be fully met by a careful inquiry into the principles involved in their construction and operation, and the presentation of such facts and suggestions as such inquiry may suggest. The use of meters in the sale of electric current for light has increased rapidly since 1890, apparently due to an increasing confidence on the part of both consumers and companies in the greater fairness of this method as compared with contract rates, which must be dependent upon the character of the installation and the number of lamps in it, rather than upon the lamps in use or the actual service rendered. The returns show in round numbers 14,500 meters in use in 1894, and the increase since 1891 has been fully 125 per cent. From a study of the construction and operation of these meters it is apparent that what may be called the electrical portions may be prepared and combined with the highest degree of accuracy, and will continue to possess this indefinitely. All these parts are submitted to electrical measurements with standard instruments of great accuracy before being placed in the combination. The chemical meter, having no mechanical parts, may be said to be entirely free from defects, but it has no device whatever for recording its action. The types now in use are so constructed as to make a supervision and inspection exceedingly difficult, if not impossible. Meters are inclosed in metallic covers or cases, and a method has been devised for sealing these after installation sufficiently to prevent tampering with them by the consumer while in use. In the Watt meter this case must be removed in order to connect the wires to the binding posts of the meter. The chemical meter must have its bottles and their contents changed as often as once a month, and while the liability to error in the manipulation of the plates and the necessary computations may be reduced to a minimum by intelligent handling and carefully prepared tabulations, it is doubtful if any method of government attestation of them is practicable. It is estimated that about 6,000 of the meters in use are chemical meters. The final adjustment of the ampere meter is made by bringing the secondary coil to the correct angle with the primary. All the meters of this type are made and set for a certain number of alternations, and if the local superintendent needs to use them on currents of different alternations, the relative position of these two coils must be changed. The covers for closing the mechanical meters are neither dust nor air tight, and as foreign substances gather upon the bearings, the tendency is to retard the meter, especially upon light loads. Although such errors are against the Company and in favor of the consumer, yet this difficulty and manipulation above described, which seem especially necessary in practical use, go far to defeat the purposes of any testing and sealing. It would doubtless prove advantageous to both consumers and companies if some practical system of State supervision of these meters could be devised similar to that now applied to gas meters, but official indorsement of any plan of governmental inspection and certification may well be deferred until one may be devised which shall give greater assurance of practical advantage to consumers than any which now seems possible."

THE Governor of Connecticut has approved the resolution passed by the General Assembly permitting the Waterbury Gas Light Company to increase its stock from $250,000 to $390,000.

THE Missouri Gas Company, to operate in Kansas City, Mo., has been incorporated, with a capital stock of $1,500,000. The Directors named are: Henry C. Rew, Churchill J. White, J. Crawford James, George P. Olmstead and Robert M. Snyder. The life of the corporation is placed at 49 years.

THE Borough Commissioners of Sea Bright, N. J., have granted permission to the Consolidated Gas Company to lay mains through the borough streets, but it is stipulated that the work of burying the same shall not be commenced until September 15th.

THE bids submitted on public lighting account, as per the invitation of the authorities of Middletown, N. Y., were: Middletown Gas Company, less than 70 lamps, $31.50 per lamp per annum; 70 to 80 lamps, $30.50; 80 to 90 lamps, $30; over 90 lamps, $29.50 per lamp. The lamps are to carry 5 feet burners; the lights are to burn each night and every night; the gas is to have an illuminating value of not less than 20 candles; and if a contract for three years would be determined upon, a concession of 50 cents per lamp was to rule. The Middletown Electric Light Company's bid was: 35 arc lights, 1,200-candle power nominal, to burn from dusk to daylight every night in the year, $108 per lamp per annum—any additional lamps to be paid for at same rate. The New York and New Jersey Globe Gas Light Company: 150 or more naphtha lamps (one year agreement), $22 per lamp per annum; for a 3-year contract, $21.50 per lamp. The respective bids of the Gas Company and the Electric Light Company were accepted, on the basis of a single year's service, and the bid of the Globe Company was returned to it for correction, on motion of Mr. Reed, who said he was opposed to giving the Company 50 cents per lamp more than was paid it last year.

THERE is every likelihood that the Springfield (Mass.) Gas Light Company will discontinue the supplying of steam heat in that city, which business the Company has carried on without profit for a number of years.

"OBSERVER" forwards the following: "Mr. Charles R. Todd, an old and honored resident of Roxbury, Mass., died at his home in Cobden street, Roxbury, on the afternoon of the 2d inst. Mr. Todd was born in Charlestown, Mass., in 1835, and moved to Roxbury at an early age, and lived there continuously to the time of his death. For some years prior to the War of the Rebellion, Mr. Todd was connected with the Rockland bank, but resigned his position (paying teller) with it in 1861, to take service with the 42d Massachusetts infantry, and remained with the regiment during the entire war. On his return home he entered the employ of the Roxbury Gas Light Company as bookkeeper, holding that position until the Company was merged with the Bay State Company. When the merger was completed, Mr. Todd was elected Secretary of the Bay State and the Boston Gas Companies, which corporations he served faithfully. The surviving members of his family are a wife and two children. The funeral services were held on Wednesday, May 5th, at his late residence, the Rev. A. J. Patterson, of the Roxbury Universalist Church, officiating."

AT the annual meeting of the Freehold (N. J.) Gas Light Company the officers chosen were: Directors, David V. Perrine, Charles A. Bennett, Charles B. Ellis, Frank B. Conover and Charles A. Bennett, Jr.; President, David V. Perrine; Secretary and Treasurer, C. A. Bennett; General Manager, C. A. Bennett, Jr. The usual dividend was declared.

AT the annual meeting of the Williamsburgh (N.Y.) Gas Light Company the following Directors were elected: Henry Steers, John T. Willets, E. R. Chapman, W. G. Rockfeller, C. H. Stoddard and H.W. Cannon. The three last named are new members, and undoubtedly represent the element which is to consolidate the gas interests of Brooklyn.

IN mentioning the formation of the Missouri Gas Company for Kansas City, Mo., we omitted to say that the objects of the Company, as formally set forth, are: "To build, buy, lease, contract, own and operate buildings, works and machinery for the manufacture, vending and distribution of gas and electricity for light, heat, power and all other purposes for which gas and electricity may be utilized; to lay pipes, mains and conduits, and to lay and extend and use such other means for the conveyance and distribution of gas, oil and electricity as may be found convenient or proper, and to carry on the business aforesaid; to acquire, use and own real estate by lease, purchase, or otherwise, for the purposes aforesaid, or any of them, and those hereinafter specified; to acquire by lease, purchase, or otherwise, coal mines, coal fields and oil fields in the State of Missouri, and to mine, work and operate the same, and to use the product thereof in the business aforesaid, or to use so much thereof as may be necessary and sell the remainder; all the aforesaid business or any part thereof to be carried on in Kansas City, in Jackson county, Mo., and in said county and in territory adjacent thereto in any other county in said State."

MR. WILLIAM FLANNERY, Superintendent of the Northwestern Globe Gas Company, of Minneapolis, Minn., died some days ago. He was 44 years of age.

THE Jackson (Mich.) Gas and Fuel Company will extend its mains this summer, contracts covering 4 miles of such work having already been entered into.

THE Pawtucket (R. I.) Gas and Electric Light Company has agreed to supply the Interstate Consolidated Street Railroad with the current necessary to operate its system.

MANY of the residents of Woodberry, Hampden and Roland, three promising suburban Baltimore districts, have petitioned the Consolidated Gas Company, of Baltimore, to extend its mains to and through the territory named.

THE Berlin Iron Bridge Company, of East Berlin, Conn., is the engineer and architect for the large 3-story building which the Union Metallic Cartridge Company is putting up at Bridgeport, Conn. The entire framework of the building will be of steel, with brick walls, and all appliances have been designed with the idea of making the construction as near fireproof as possible.

THE project to establish a gas plant at Winchester, Mass., is not likely to materialize.

THE reorganized Fort Madison (Ia.) Water Company, which is a consolidation of the water, gas and electric lighting interests of Fort Madison, is controlled by Portland (Me.) capitalists. Its officers are: President, George E. Noyes; Treasurer, H. M. Verrill—both of Portland.

SOME time ago, actuated by a violent fit of retrenchment, the San Francisco Supervisors passed a resolution ordering that all public street lights (gas and electric) be shut off, from May 15th to July 1st. Naturally the order provoked much indignation and public outcry, the lighting Companies also adding earnest protests against the carrying out of such an absurd mandate. President Crockett, of the San Francisco Gas Light Company, had this to say about the proposed action: "This matter has had a broader scope than simply obeying this order of the Supervisors to shut off the street lights for the next six weeks. We are furnishing gas to the city for illuminating purposes under a contract which will not expire until the fall of 1896. This contract provides that we must furnish light between certain specified hours of the day. More than that, we are under $35,000 bonds to do so, and Adam Grant and Levi Strauss are the sureties. Now, the question is, can the Supervisors compel us to break our contract while there is money in the street light fund in the treasury? And further, can they legally divert the money in the street light fund to any other purpose? At the end of the fiscal year, if there is any money left in this fund it can be turned into the general fund. There is some doubt in our minds if this can be done before the end of the fiscal year at the cost of leaving the city in darkness for a month or two. Suppose, for instance, that the Gas Company should find a use for its gas more profitable to us than furnishing it to the city, and we should break our contract by declining to furnish gas under the contract. Damage suits would be instituted within 24 hours and our sureties would have to stand the damages. Now, the city's obligation to us under our contract is as great as ours to the city, and while there is money in the street light fund we cannot see how the Supervisors can legally break the written and secured agreement. If there was no money in this special fund, and we continued to light the streets, we would be taking our chances on being paid, for the Supreme Court has held that we are supposed to have full knowledge of the condition of the treasury. There is another feature in connection with this case. If we obey the mandate of the Supervisors and turn off the gas for the next six weeks we may be sued by some citizen for not living up to our contract, and if it should be decided that the action of the Supervisors in making this order is illegal we might have to stand the damages. In cases where for a few nights the lights were shut off to save money, as it was recently, it did not make much difference, because there was a full moon then. But to leave the city in darkness for nearly two months with $40,000 or $50,000 in the street light fund, is a more serious question, especially where damage suits might arise and the legality of the Supervisors' action be questioned." The Companies did not obey the order to discontinue the lighting, and on May 20 the Supervisors rescinded their action by the passage of the following:

Whereas, Said action was hastily taken without proper consideration, and was unwise in that it would be fraught with danger to the lives and property of our citizens and accomplish no beneficial results; therefore,

Resolved, That this Board hereby repeals the resolution whereby the San Francisco Gas Light Company and the Edison Light and Power Company were required to discontinue the lighting of the streets on and from May 15th, and the Companies are hereby required to comply with the provisions of their respective contracts.

THE AMERICAN GAS LIGHT JOURNAL

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PROPRIETORS.

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ASST. EDITOR—T. J. Cunningham.
MANAGER—C. E. Sanderson.

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AGENTS:
New York—American News Co., 39 and 41 Chambers St
Germany—B. Westermann & Co., of New York.

MONDAY, JUNE 10, 1895.

The Paper Awarded the Second Prize in the Cicero (Ills.) Competition.

By MRS. DELL NASH.

[The following is the text of the paper which was awarded the second prize in the competition instituted by the proprietors of the Cicero (Ills.) Gas Company for the best original article descriptive of the merits of cooking by gas. For the conditions of the competition see JOURNAL, May 27, p. 773.—ED.]

In the kitchen of a cosy home near Chicago there was trouble one March morning, for the chimney would not "draw" and Mrs. Morgan could not make a fire.

Mr. Morgan, to whom such duties more properly belonged, was a "railroad man," and had reached home late the night before, besides having to go again that morning.

"Time waits for no man," and Mrs. Morgan watched the hands of the little clock surely approaching the breakfast hour, while the fire, with a perversity which often seems to possess inanimate things, still burned so slowly that she was obliged to give up the rolls she intended having, and at the last moment, summoned her husband to a breakfast of coffee and warmed potatoes.

Now this March weather had also affected Mr. Morgan, so that he was decidedly "grumpy," and he paid no attention to his wife's distressed face, nor to her remark that "the fire would not burn for so long she could get nothing more for breakfast."

"If I only had a gas range, it would save so much time and trouble and dirt!" "You couldn't cook anything decent if you had," said Mr. Morgan, rising from the table. Now he well knew that this was not true, also that she was the dearest wife in the world, but he chose to be ill-tempered and went away with only a short "good-by."

Poor Mary! She was crying dismally and wondering if they were the same persons who had vowed "to love and cherish" but three years before.

A quick knock at the door and her friend and neighbor Mrs. Duncan came in.

"Tears, tears, idle tears, and why?" and her bright face became grave as Mrs. Morgan related her woes, and going to the stove she gave the fire a vigorous poke.

"I wish, dear, you had a gas stove; mine is indeed a 'Jewel,' in fact as well as in name; I could not keep house without it. But to my errand: We shall entertain a few friends Wednesday evening, and wish you and Mr. Morgan to come to supper.

Mrs. Morgan's face brightened as a happy thought struck her. "I will do so on one condition—that I may prepare the refreshments with the help of your 'Jewel' gas range."

"Well, Mary Morgan, if it were anyone else I should be offended; but I will gratify your whim for this once."

Wednesday evening the invited guests assembled at the home of Mr. and Mrs. Duncan, and at 11 o'clock all repaired to the dining room, where a delightful repast awaited them.

"I declare, Duncan," said Mr. Morgan, "a man should be happy whose wife is such a cook; this sponge cake is perfection. I should be glad indeed if my wife could equal this."

Mrs. Duncan glanced at her friend, and notwithstanding her look of distress, quietly replied: "I am glad, Mr. Morgan, that you appreciate this excellent cookery, but it is not mine. It is your wife's, done in my kitchen with my 'Jewel' gas range."

Mr. Morgan's face was a study, but quickly appreciating the situation, he turned to his wife and said, amidst the applause of the company: "Well done, Mary; I am proud of you, and to-morrow we will order a 'Jewel' of the Cicero Gas Company." And they did. And now white-winged Peace has folded her wings in one more house on the West Side.

The Market for Gas Securities.

The Consolidated Company's dividend (a regular quarterly of 2 per cent.), is payable on the 15th inst., and the transactions on the Exchange have been made ex-dividend. By noon of to-day (Friday) sales were reported at 144¾, and it looks that the 150 mark will soon be reached. Equitable has increased to 200 bid, with the likelihood that even that price would bring out very little stock. Mutual is steady, at 170, bid, and New York and East River common has again got beyond 31. Although it is difficult to predict with any fair degree of certainty regarding the future of these shares, we nevertheless say (and do so on the opinion of financiers well qualified to speak on the subject) that East River common is worth a speculative try. Standard preferred is bid for at 107, and the common is in demand at 59 bid.

There is no change in Brooklyn quotations, which are merely nominal. Any time, almost, the public may expect to hear something of the details of the merger. Western, of Milwaukee, advanced sharply to 62½ bid, and Chicago is steady and dull. Baltimore Consolidated is active and weaker, at 61½ ex-dividend. Lacledes are higher, and so is Bay State common. Even the celebrated Bay State "Incomes" experienced an increase to 34–35. New Haven gas is very strong, at 225 bid, and there is an order in the market for a fair lot of the stock, the execution of which is likely to put the price to 240.

Gas Stocks.

Quotations by Close & Nash, Brokers and Dealers in Gas Stocks.

35 WALL ST., NEW YORK CITY.

JUNE 10.

☞ All communications will receive particular attention.
☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$35,490,000	100	144¼	144½
Central	500,000	50	140	..
" Scrip	220,000	..	100	..
Equitable	4,000,000	100	200	..
Bonds, 6's	1,000,000	1,000	..	..
" 1st Con. 5's	2,800,000	1,000	111	112
Metropolitan Bonds	658,000	..	108	112
Mutual	3,500,000	100	170	..
" Bonds	1,500,000	1,000	100	102
Municipal Bonds	750,000	..	..	..
Northern	150,000	50	90	91
" Bonds	150,000	1,000	..	98
New York and East River	5,000,000	100	31½	32
Preferred	2,000,000	100	51	..
Bonds	3,500,000	1,000	95½	96½
Richmond Co., S. I.	348,650	50	50	..
" Bonds	100,000	..	..	..
Standard	5,000,000	100	59	61
Preferred	5,000,000	100	107	..
Bonds, 1st Mortgage, 5's	1,500,000	..	105	106
Yonkers	.....	50	101x	.
Gas Co's of Brooklyn.				
Brooklyn	2,000,000	25	125	..
Citizens	1,200,000	20	65	..
" S. F. Bonds	320,000	1,000	..	101
Equity	2,000,000	10	..	..
" Bonds	1,000,000	..	..	..
Fulton-Municipal	3,000,000	100	175	..
" Bonds	300,000	..	103	..
Peoples	1,000,000	10	90	.
" Bonds, 7's	368,000	..	100	..
" " 6's	94,000	..	98	100
Metropolitan	870,000	100	170	..
" Bonds, 5's	70,000	..	..	..
Nassau	1,000,000	25	200	..
" Ctfs.	700,000	1,000	99	100
Williamsburgh	1,000,000	50	200	..
" " Bonds	1,000,000	..	107	110
Out-of-Town Companies.				
Bay State	5,000,000	15	23	24½
" Income Bonds	2,000,000	1,000	34	35
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	75½	77
2d " " "	3,000,000	1,000	55	57
Buffalo Mutual	750,000	100	120	..
" Bonds	200,000	1,000	95	100
Chicago Gas Co.	25,000,000	100	74	74¼
Chicago Gas Lt. & Coke Co.				
Guaranteed Gold Bonds	7,850,000	1,000	93	93½
Columbus	1,000,000	..	..	..
1st Mortgage	1,085,000	..	..	..
Consumers, Jersey City	2,000,000	100	75	80
" Bonds	600,000	1,000	99	..
Cincinnati G. & C. Co.	7,000,000	100	..	203¾
Consumers, Toronto	1,800,000	50	184½	187
Central, San Francisco	.....	..	90	100
Capital, Sacramento	.....	..	..	50
Consolidated, Baltimore	11,000,000	100	61½	62
Mortgage, 6's	3,600,000	..	107	107½
Chesapeake, 1st 6's	1,000,000	..	..	..
Equitable, 1st 6's	910,000	..	..	..
Consolidated, 1st 5's	1,400,000	..	..	..
Detroit	4,000,000	..	29	..
" Con. Bonds	4,312,000	..	..	..
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Fort Wayne	2,000,000	..	75½	..
" Bonds	2,000,000	..	83¼	.
Hartford	750,000	25	120	128
Indianapolis	2,000,000	..	139	142
" Bonds, 6's	2,650,000	..	104	..
Jersey City	750,000	20	180	..
Lafayette Gas Co., Ind.	1,000,000	100	86	..
Bonds	1,000,000	1,000	88	..
Louisville	2,870,000	50	..	130
Laclede, St. Louis	7,500,000	100	32	32½
Preferred	2,500,000	100	88	90
Bonds	9,084,400	1,000	96½	97
Little Falls, N. Y.	50,000	100	..	100
Bonds	25,000	..	..	100
Montreal, Canada	2,000,000	100	200	..
New Haven	.....	25	225	..
Oakland, Cal.	.....	..	42½	43
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	2,100,000	1,000	..	108
2d "	2,500,000	1,000	104	105

Peoples, Jersey City	500,000	50	..	175
Paterson, N. J.	.....	25	90	102
Rochester Gas & Elec. Co.	2,150,000	50	..	..
Preferred	2,150,000	50	81	..
Consolidated 5's	2,000,000	..	87½	90
Syracuse, N. Y.	500,000	25	..	..
San Francisco, Cal.	10,000,000	100	72¾	73¼
Washington, D. C.	2,000,000	20	250	..
Western, Milwaukee	4,000,000	100	59	..
Bonds, 5's	3,556,000	..	87	88½
Wilmington, Del.	500,000	50	188	190

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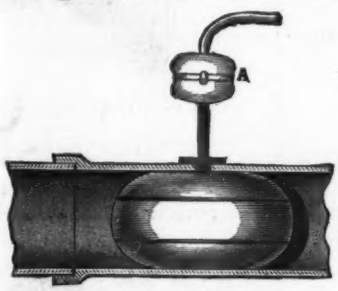

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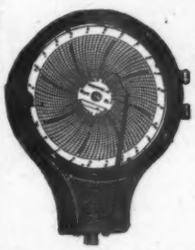

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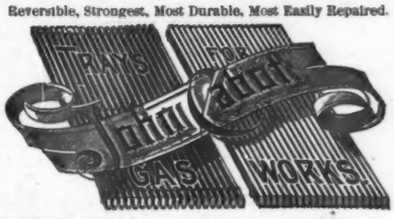

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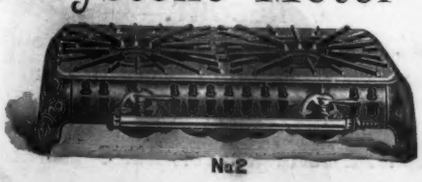

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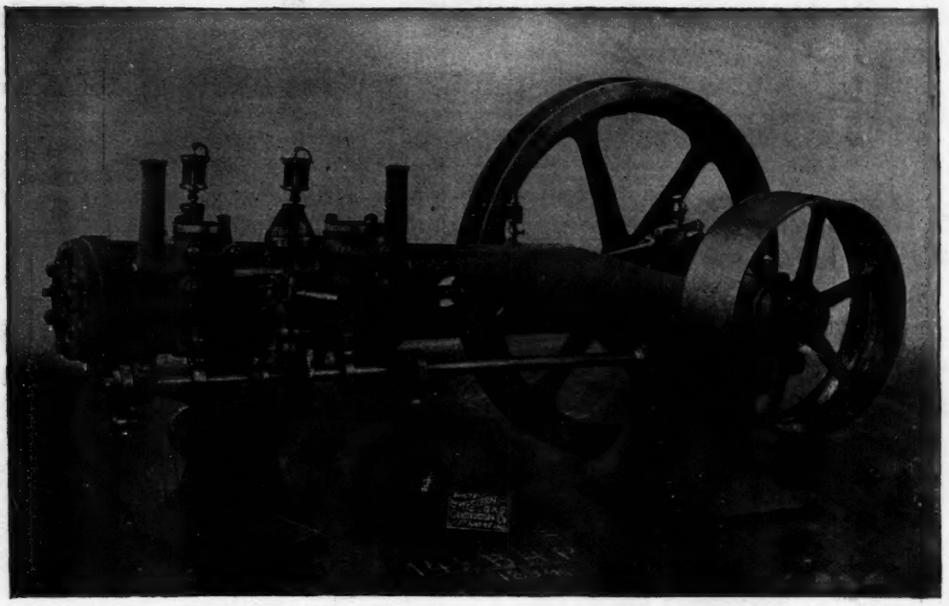

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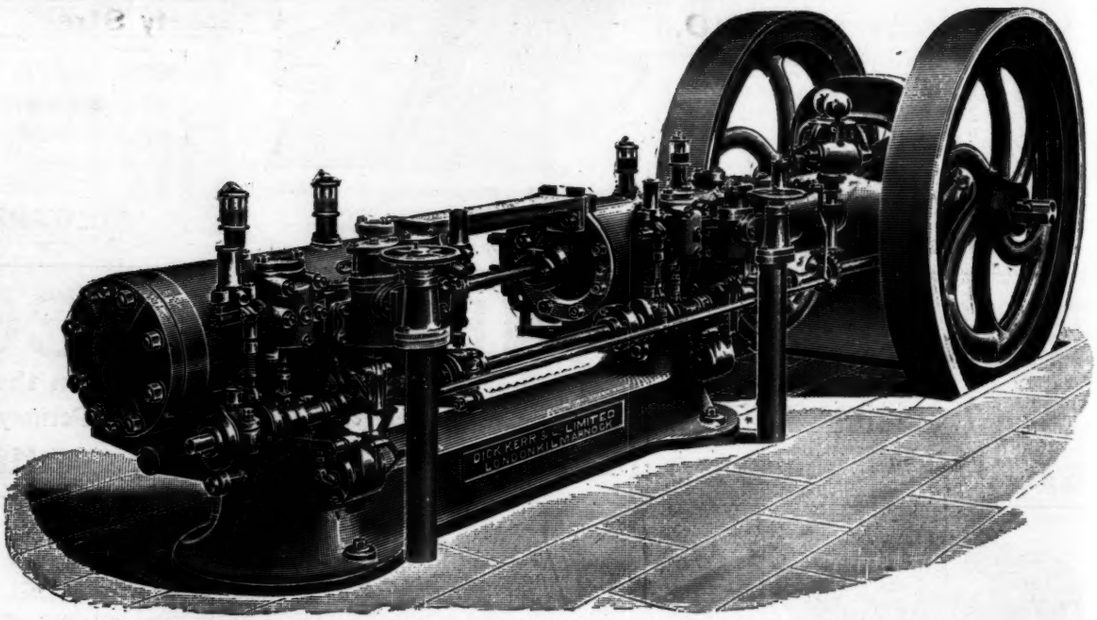

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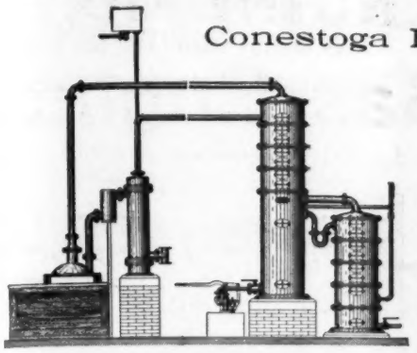

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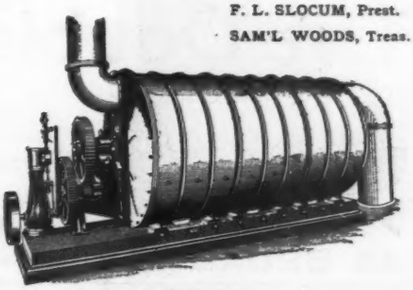

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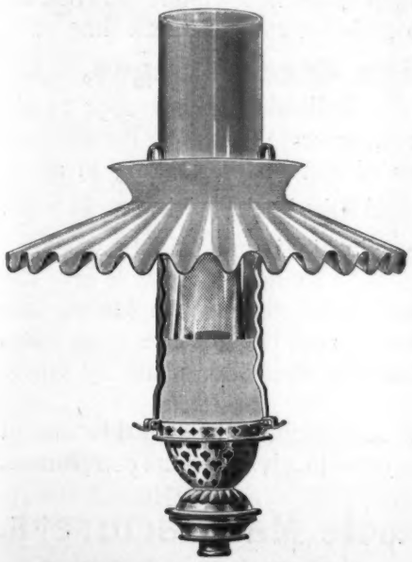

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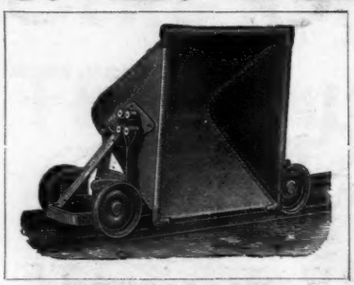

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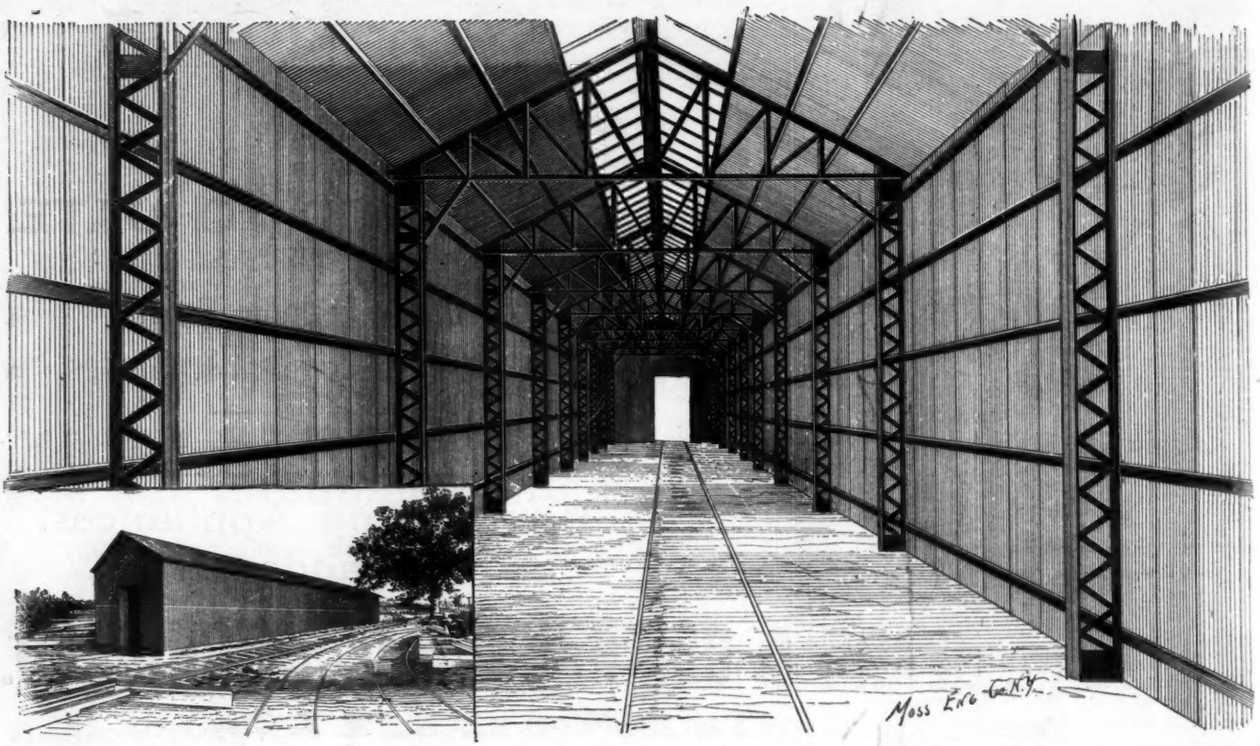

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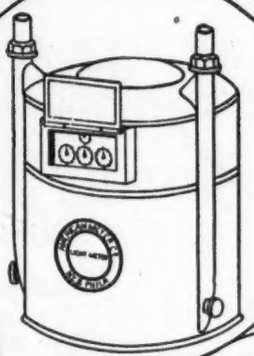
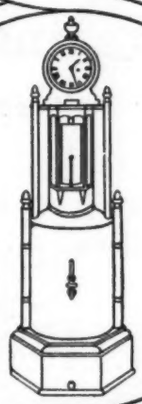




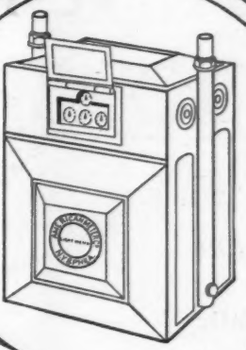
PUBLIC LIGHTING TABLE.

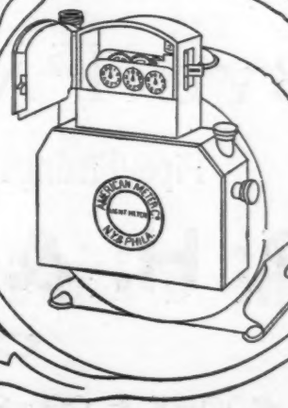
JUNE, 1895.

Day of Week.	Date.	Table No. 1. FOLLOWING THE MOON. Light.	Extinguish.	Table No. 2. NEW YORK CITY. ALL NIGHT LIGHTING. Light.	Extinguish.
				P.M.	A.M.
Sat.	1	12 20 AM	3.30 AM	7.15	3.15
Sun.	2	12.50	3.30	7.15	3.15
Mon.	3	1.10	3.30	7.15	3.15
Tue.	4	1.50	3.30	7.25	3.15
Wed.	5	2 20	3.30	7.25	3.15
Thu.	6	No L.	No L.	7.25	3.15
Fri.	7	No L. FM	No L.	7.25	3.15
Sat.	8	No L.	No L.	7.25	3.15
Sun.	9	8.00 PM	10.50 PM	7.25	3.15
Mon.	10	8.00	11.30	7.25	3.15
Tue.	11	8.00	12.00 AM	7.25	3.15
Wed.	12	8.00	12.20	7.25	3.15
Thu.	13	8.00	12.40	7.25	3.15
Fri.	14	8.00	1.00	7.25	3.15
Sat.	15	8.00 LQ	1.20	7.25	3.15
Sun.	16	8.00	1.40	7.25	3.15
Mon.	17	8.00	2.10	7.25	3.15
Tue.	18	8.00	2.30	7.30	3.15
Wed.	19	8.00	3.30	7.30	3.15
Thu.	20	8.00	3.30	7.30	3.15
Fri.	21	8.00	3.30	7.30	3.15
Sat.	22	8.00 NM	3.30	7.30	3.15
Sun.	23	8.00	3.30	7.30	3.15
Mon.	24	8.00	3.30	7.30	3.15
Tue.	25	8.00	3.30	7.30	3.15
Wed.	26	8.00	3.30	7.30	3.15
Thu.	27	10.10	3.30	7.30	3.15
Fri.	28	10.30	3.30	7.30	3.15
Sat.	29	10.50 FQ	3.30	7.30	3.15
Sun.	30	11.20	3.40	7.30	3.15

TOTAL HOURS LIGHTING DURING 1895.

By Table No. 1.	Hrs.Min.	By Table No. 2.	Hrs.Min.
January	237.00	January	423.20
February	196.40	February	355.25
March	195.50	March	355.35
April	165.30	April	298.50
May	153.40	May	264.50
June	138.20	June	234.25
July	146.30	July	243.45
August	152.50	August	280.25
September	165.10	September	321.15
October	186.10	October	374.30
November	204.10	November	401.40
December	219.30	December	433.45
Total, yr.	2161.20	Total, yr.	3987.45





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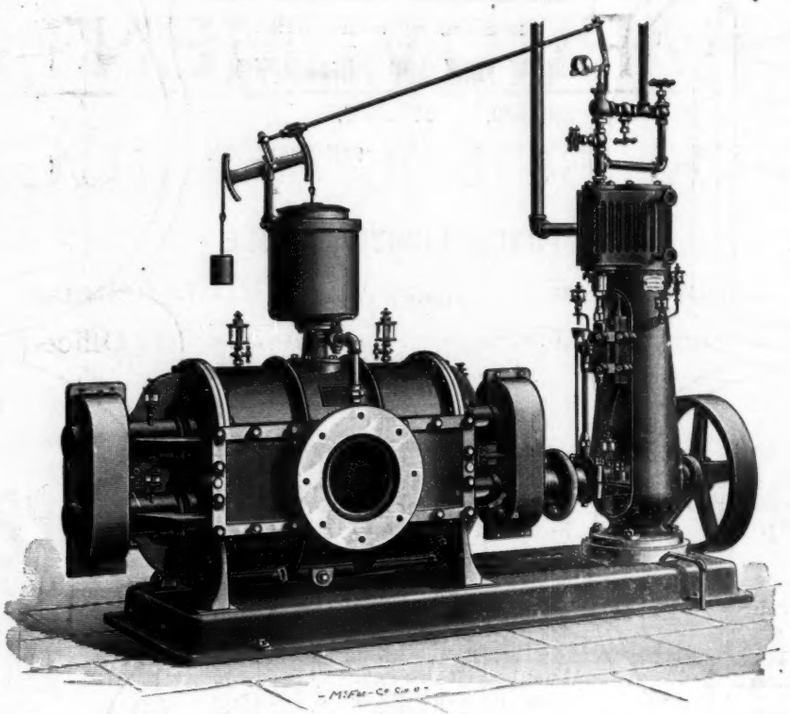

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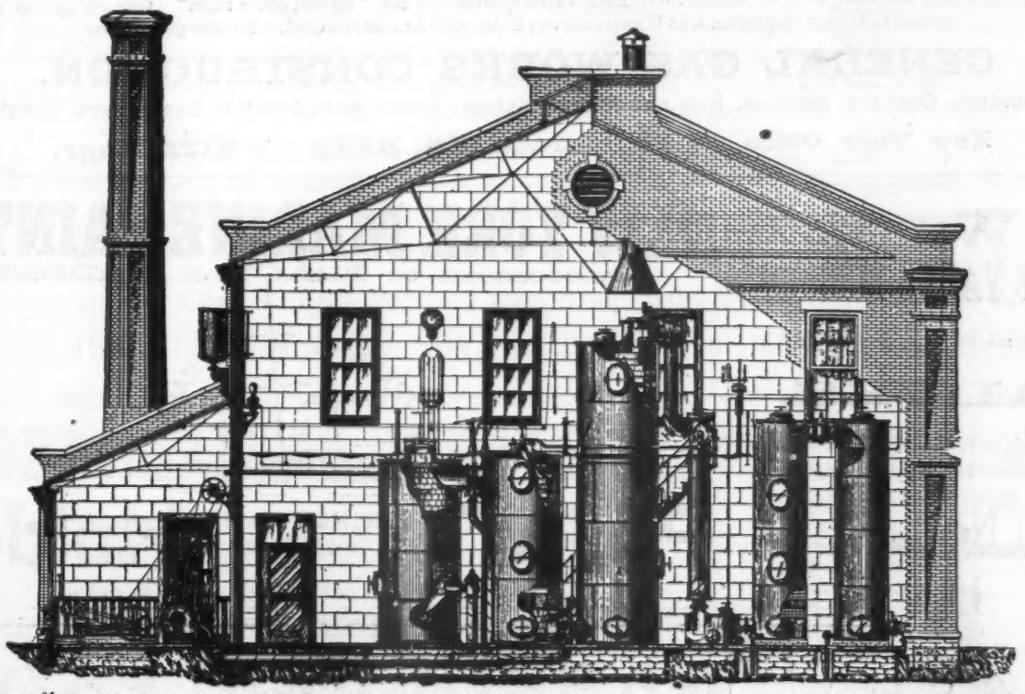

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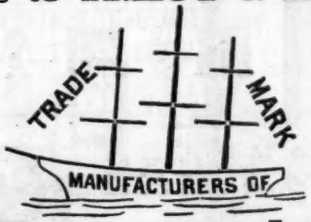

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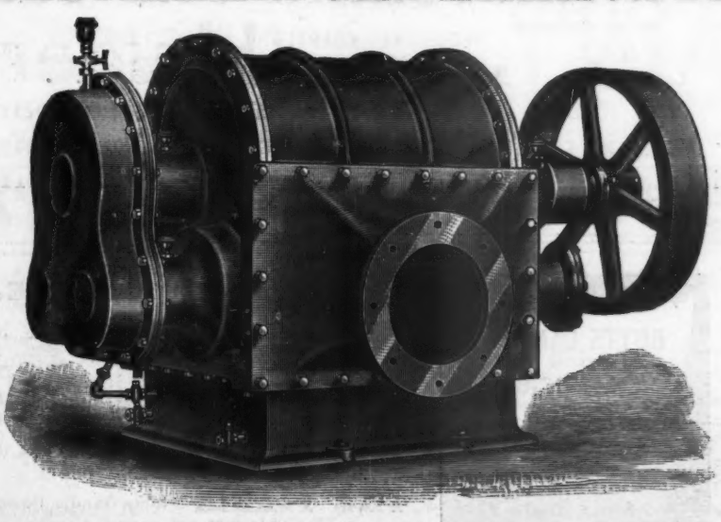

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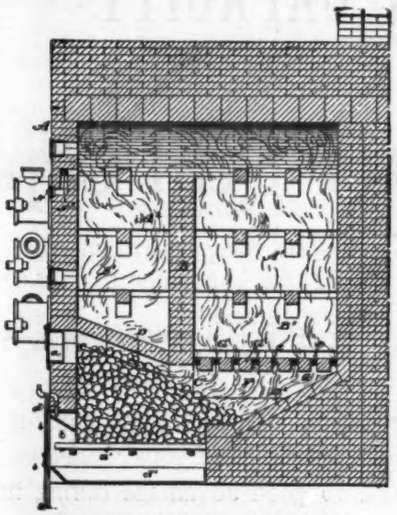

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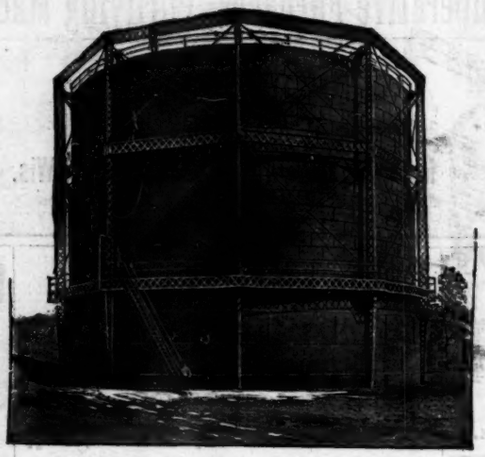

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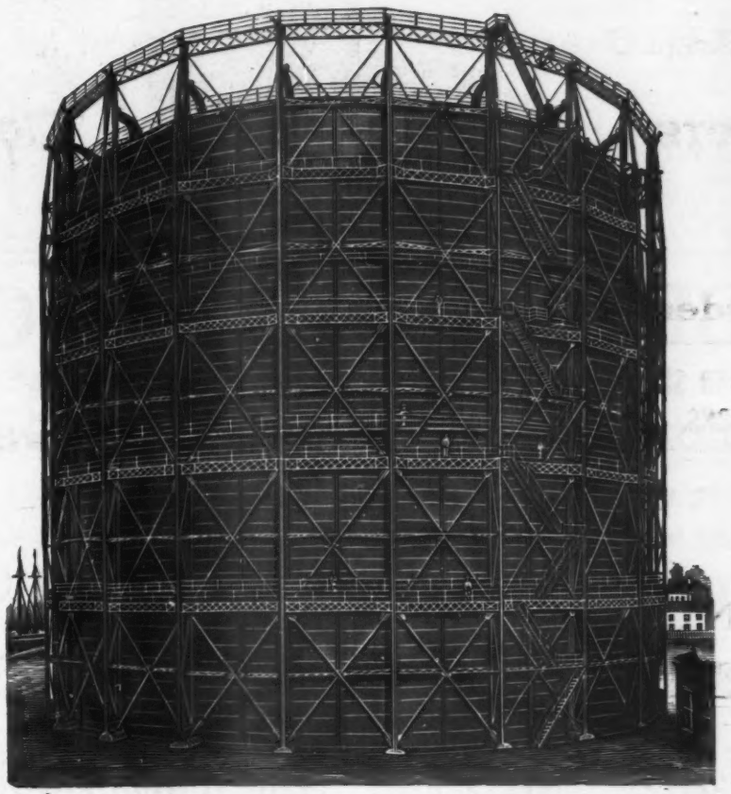

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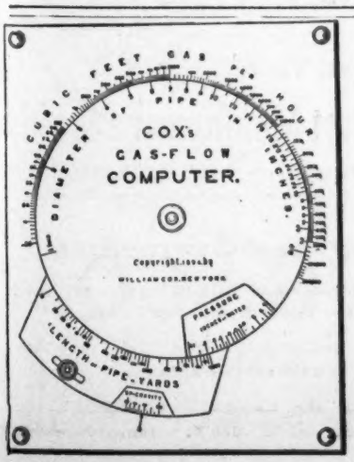

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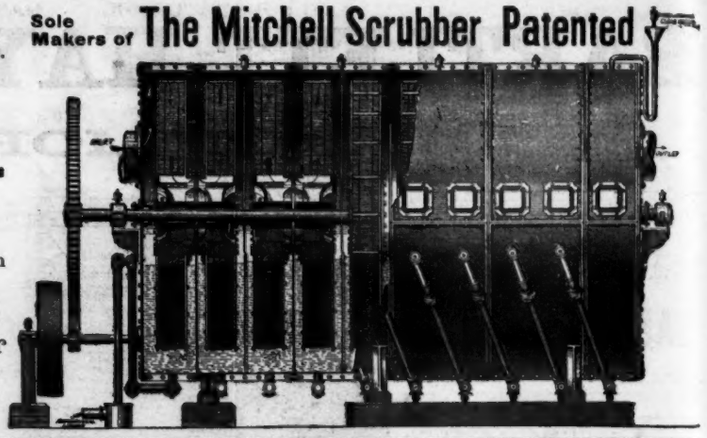

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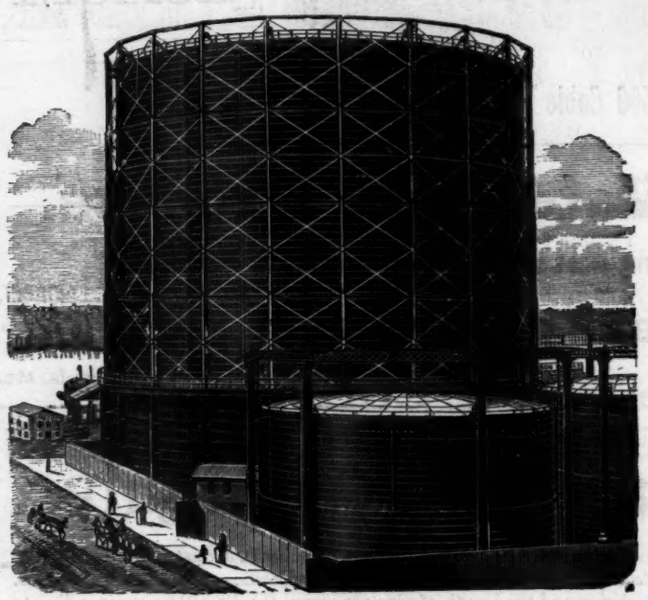

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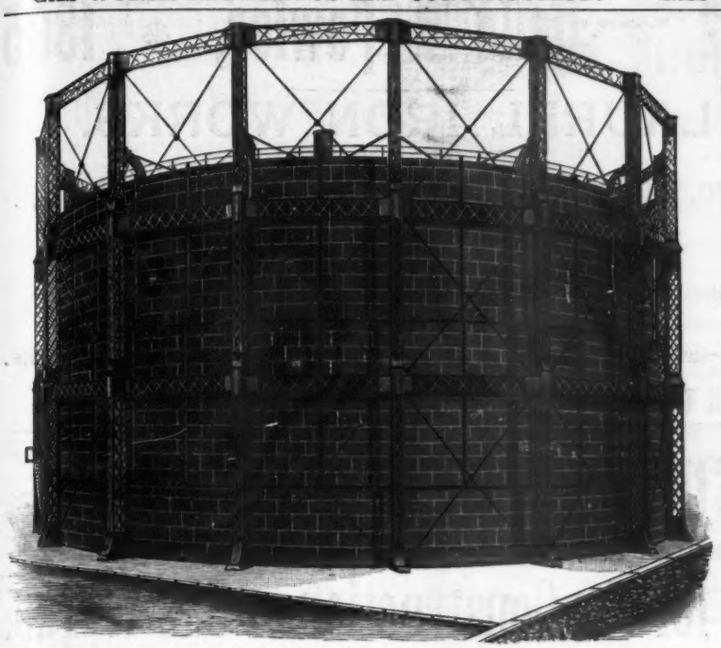

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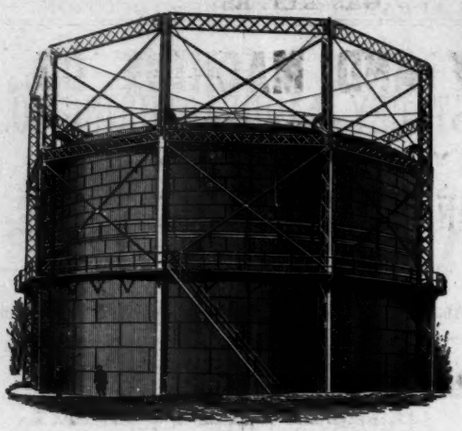

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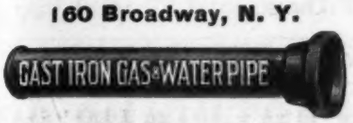

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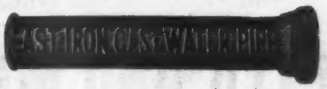

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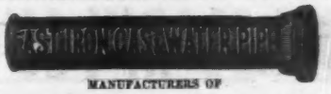

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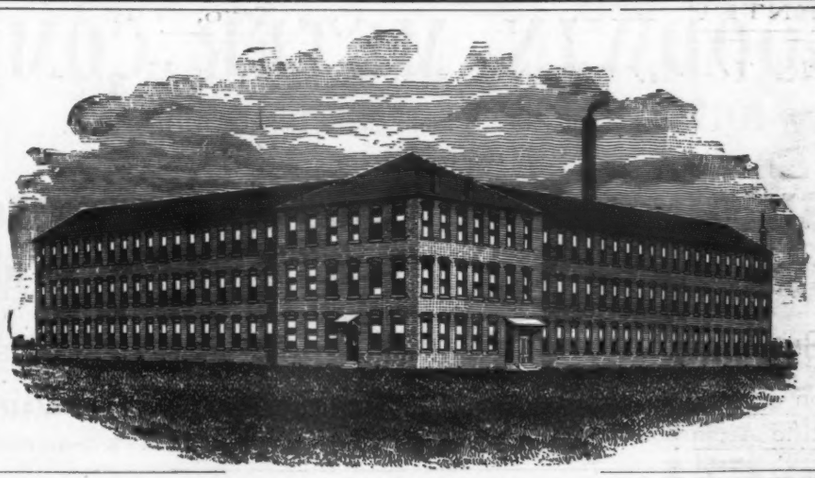

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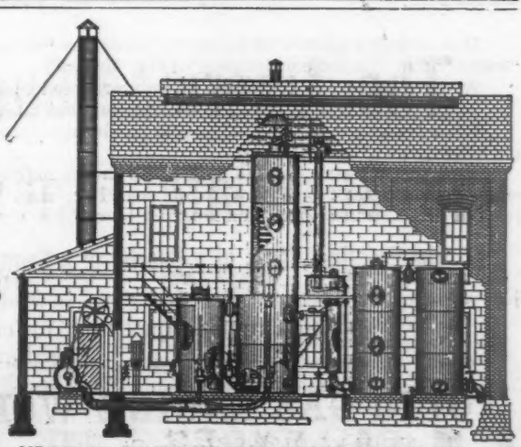

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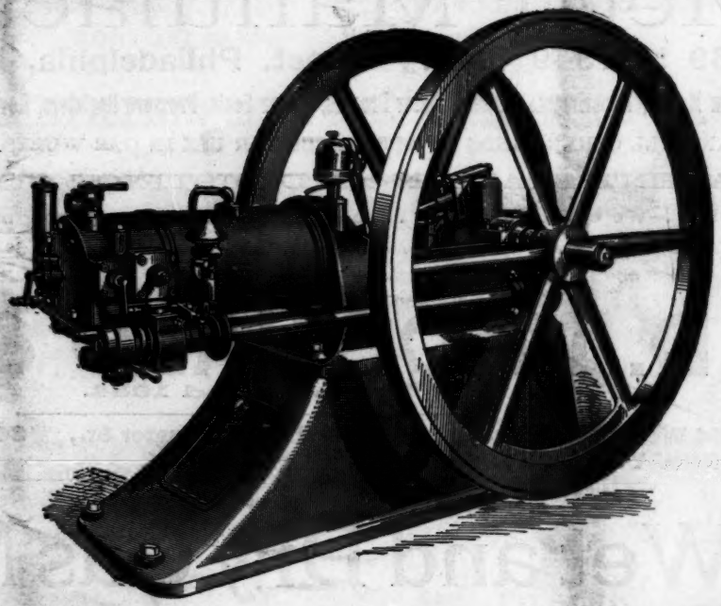

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